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TRANSACTIONS

OF THE

New York State Agricultural Society.

VOLUME XXXIII—1877-1882.

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CONSTITUTION.

The style of this society shall be "The New York State Agricultural Society." Its object shall be to improve the condition of agriculture, horticulture and the household arts.

SECTION. 1. The society shall consist of such citizens of the state as shall signify in writing their wish to become members, and shall pay, on subscribing, not less than one dollar, and annually thereafter one dollar; and also of honorary and corresponding members. The presidents of county agricultural societies, or a delegate from each, shall, *ex officio* be members of this society. The payment of ten dollars, or more, shall constitute a member for life, and shall exempt the donor from annual contributions.

SEC. 2. The officers of the society shall consist of a president, eight vice-presidents, one to be located in each judicial district, a recording secretary, a corresponding secretary, a treasurer, an executive committee, to consist of the officers above named, and eight additional members; and five of the ex-presidents shall be, *ex officio*, members of the executive committee, and these five shall consist of the five ex-presidents whose term of office has last expired, of whom three shall constitute a quorum; and that the ex-presidents of the society, not members of the executive committee, shall constitute a board of counselors to whom may be referred, for consultation and advice, all questions that may from time to time arise, and in the decision of which the society may in any manner be interested; and a general committee, the members of which shall be located in the several counties, and be equal to the representatives in the House of Assembly.

SEC. 3. The recording secretary shall keep the minutes of the society. The corresponding secretary shall carry on the correspondence with other societies, with individuals, and with the general committee, in the furtherance of the objects of the society. The treasurer shall keep the funds of the society, and disburse them on the order of the president or a vice-president, countersigned by the recording secretary, and shall make a report of the receipts and expenditures at the annual meeting in January. The executive committee shall take charge of and distribute or preserve all seeds, plants, books, models, etc., which may be transmitted to the society; and shall have also the charge of all communications designated or calculated for publication, and, so far as they may deem expedient, shall collect, arrange and publish the same in such manner and form as they shall deem best calculated to promote the objects of the society. The general committee are charged with the interests of the society in the counties in which they shall respectively reside, and will constitute a medium of communication between the executive committee and the remote members of the society.

SEC. 4. There shall be an annual meeting of the society on the Wednesday after the third Tuesday in January, in the city of Albany, at which time all the officers shall be elected by a plurality of votes, and by ballot, with the exception of the general committee for the counties, which may be appointed by the executive

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committee, who shall have power to fill any vacancies which may occur in the offices of the society during the year. Extra meetings may be convoked by the executive committee. Fifteen members shall be a quorum for the transaction of business. No person shall be qualified to vote at any election of officers of the society, unless he shall have been a member of the society for at least thirty days prior to such election.

SEC. 5. The society shall hold an annual cattle show and fair at such time and place as shall be designated by the executive committee.

SEC. 6. The constitution may be amended by vote of two-thirds of the members attending any annual meeting, upon one year's previous notice in writing.

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EX-PRESIDENTS, AND THE PLACES OF THE FAIRS.

Year.	Name.	Place of fair.
184..	Joel B. Nott *	Syracuse.
1842..	James S. Wadsworth *	Albany.
1843..	James S. Wadsworth	Rochester.
1844..	John P. Beekman *	Poughkeepsie.
1845..	Benjamin P. Johnson *	Utica.
1846..	John M. Sherwood *	Auburn.
1847..	George Vail *	Saratoga.
1848..	Lewis F. Allen	Buffalo.
1849..	John A. King *	Syracuse.
1850..	Ezra P. Prentice *	Albany.
1851..	John Delafield *	Rochester.
1852..	Henry Wager *	Utica.
1853..	Lewis G. Morris	Saratoga.
1854..	William Kelly *	New York.
1855..	Samuel Cheever *	Elmira.
1856..	Theodore S. Faxton *	Watertown.
1857..	Alonzo S. Upham *	Buffalo.
1858..	William T. McCoun *	Syracuse.
1859..	Abraham B. Conger	Albany.
1860..	Benjamin N. Huntington *	Elmira.
1861..	George Geddes *	Watertown.
1862..	Ezra Cornell *	Rochester.
1863..	Edward G. Faile *	Utica.
1864..	James O. Sheldon	Rochester.
1865..	Theodore C. Peters *	Utica.
1866..	John Stanton Gould *	Saratoga.
1867..	Marsena R. Patrick	Buffalo.
1868..	Thomas Hall Faile *	Rochester.
1869..	Samuel Campbell	Elmira.
1870..	Solon D. Hungerford *	Utica.
1871..	Richard Church	Albany.
1872..	Milo Ingalsbe	Elmira.
1873..	Benjamin F. Angel	Albany.
1874..	Harris Lewis	Rochester.
1875..	Alexander S. Diven	Elmira.
1876..	Edwin Thorne	Albany.
1877..	Patrick Barry	Rochester.
1878..	George W. Hoffman	Elmira.
1879..	Horatio Seymour	Utica.
1880..	N. Martin Curtis	Albany.
1881..	Robert J. Swan	Elmira.
1882..	John D. Wing	Utica.
1883..	George F. Mills	Rochester.

* Deceased.

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HONORARY AND CORRESPONDING MEMBERS.

Ackland, Sir Thomas Dyke, Bart., London.
Ackland, Thomas Dyke, Jr., London.
Airoles, Liron, Nantes.
Boileau, Sir John P., Bart., London.
Bodisco, Alexander, St. Petersburg.
Barrall, M. J. A., Paris.
Bixio, Alexander, M. D., Paris.
Belanger, C. H., Martinique.
Borg, Louis, Paris.
Cowden, Joseph, Glasgow.
Chevreil, M., Paris.
Campbell, Alexander, Martinique.
Cameron, Charles A., M. D., Dublin.
Delagorde, M., Paris.
Davy, John Tanner, England.
Debouis, Dr., Paris.
Edwards, Milne, Paris.
Fergusson, Adam, Canada.
Fararo, Dr. Jose Tell, Brazil.
Friedlander, Dr. A., St. Petersburg.
Falkersabouf, Prof. Loon, St. Petersburg.
Foote, Elisha, Washington.
Gasparin, M., Paris.
Gourcy, Comte de, Paris.
Gluck, Dr. Isidor, Vienna.
Goessman, Dr. Charles A., Amherst, Mass.
Hannam, John, London.
Hudson, James, London.
Hergien, Dr., Paris.
Howard, Sanford, Lansing, Mich.
Hoffman, John T., New York.
Ignatz, Zickerman, Asszonyrecs, Hungary.
Imre, Count Miko, Transylvania.
Johnson, Cuthbert W., London.
Johnston, James F. W., Durham, Eng.
Kergolay, Comte de, Paris.
Lawrence, Abbott, Boston.
Latour, Major L. A. Huguet, Montreal.
Laszlo, Korismics, Pesth.
Learmonth, Thomas, Victoria.
Le Couteur, Colonel John, Jersey.
Morris, Margaretta, Pennsylvania.
Maxwell, John Hall, Edinburgh.
Melville, G. Paris.
Mertens d'Ostens, Baron, Belgium.
Miklos, Pataky, Transylvania.
Mano, Sickerman, Kotoj, Hungary.
Moritz, Glück, Goritz, Hungary.
Mornay, Mauny de, Paris.
Montholon, Marquis Charles de, Paris.
Norton, John P., New Haven, Conn.
Nottbeck, Baron J. de, St. Petersburg.
Payen, A. Paris.
Pusey, Phillip, England.
Pierce, Benjamin, Cambridge, Mass.
Potter, E. R., Kingston, R. I.
Robinet, M., Paris.
Roehn, Eugene, Paris.
Ruffin, Edward, Richmond, Va.
Shaw, William, London.
Simmonds, P. L., London.
Skinner, J. S., Philadelphia.
Sturge, William, Bristol.
Strafford, Henry, London.
Takall, Sickerman, Kotoj.
Toysef, Havas, Pesth.
Vaillant, Marshal, Paris.
Vilmorin, Louis, Paris.
Whitney, Henry, New Haven, Conn.
Wilder, Marcus P., Boston, Mass.
Wilson, Prof. John, Edinburgh.
Weiss, Dr. Adolph, Vienna.
Waterman, Henry, Hudson, N. Y.
Zimerman, ——, Mad., Hungary.

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LIFE MEMBERS.*

A.

Abernethy, Charles, New York.
Adriance, John P., Poughkeepsie.
Agnew, Alexander M., New York.
Agnew, Cornelius R., M. D., New York.
Allen, John, New York.
Allen, Lewis F., Buffalo.
Allen, Wm. M., Harlem.
Alvord, Henry E., Mountainville.
Ames, D. T., Syracuse.
Amsdell, George I., Albany.
Amsdell, T. L., Albany.
Andrews, B. H., Waterbury, Conn.
Angel, Benjamin F., Geneseo.
Appleton, Francis H., West Peabody, Mass.
Armstrong, W. A., Elmira.
Arnold, B. G., New York.
Arnold, Wm. E., Otego.*
Arnot, Stephen T., Elmira.
Aspinwall, J. L., Barrytown.
Aspinwall, W. H., New York.*
Astor, John Jacob, Jr., New York.
Atwater, Dwight, Elmira.
Austin, J., Jr, Albany.*
Avery, Ralph H., Canastota.
Aycrigg, Thomas G., Passaic, N. J.*

B.

Babbitt, B. T., New York.
Babcock, F. M., New York.*
Babcock, Samuel D., New York.
Badger, G. F., New York.
Badger, H. M., Elmira.
Bailey, Isaac H., New York.
Bailey, Nathaniel P., New York.
Bailey, William H., Plattsburgh.
Baird, David, Springfield Centre.
Baker, Aaron Y., Hammondsport.
Baker, B. F., Ballston.
Baker, B. M., Rochester.
Baker, I. V., Comstock's Landing.
Balcom, Uri, Oconto, Wis.
Baldwin, Anson, Yonkers.
Baldwin, Harvey, Syracuse.*
Baldwin, W. A., Wellsburgh.
Banks, John, Bainbridge.
Barber, Amaziah D., New York.
Bard, John, Barrytown.*
Barnard, Charles, Utica.
Barnett, Abraham, Albany.
Barry, Patrick, Rochester.
Bartlett, H. B., Paris.
Barto, H. D., Trumansburgh.
Beadle, E. L., M. D., Poughkeepsie.
Beadle, Tracy, Elmira.
Becar, Noel J., New York.*
Beckwith, B. M., Plattsburgh.
Beebe, William, New York.
Beekman, J. P., Kinderhook.*
Bell, David K., West Brighton.
Bell, John H., West Brighton.
Bell, Thos., Eatontown, N. J.*
Benham, A. B., Dryden.
Bennett, Miles C., Big Flats.
Bennett, Wm. H., Saratoga Springs.
Bentley, Henry J., Horseheads.
Bicknell, J. G., Westmoreland,
Bills, O. A., Yonkers.
Birdsall, Benjamin, Mendon Centre.
Birnie, William, Springfield, Mass.
Blake, W. C., Northfield, Vt.
Blanchard, J. H, Utica.
Blessing, Fred., Slingerlands.
Bliss, Jonathan, New York.
Blood, Isaiah, Ballston.*
Boardman, Truman, Trumansburgh.
Bogart, Wm. H., Aurora.
Bogert, M. D., Rockland Lake.
Bonesteel, Peter S., Victor.
Bonfoy, Seth, West Winfield.

*From 1841 to 1883. The names of members whose deaths have been notified to the secretary are marked with an asterisk.

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Boorman, James Hyde Park.*
Bostock, E., Albany.
Bostwick, E., Albany.
Bostwick, John, Chili.
Boswell, John, Chili.
Bouck, Tobias, Cobleskill.
Boughton, Chauncey, Half Moon.
Bowditch, Edward, Albany.
Bowen, H., Medina.
Bowen, Henry C., Brooklyn.
Bowen, O. F., West Lowville.
Bowne, Robert, New York.
Bowne, S. R., Rhinebeck.
Bowne, Walter, Flushing.
Boyce, Kerr, Flushing.
Boyce, Wm., New York.
Boynton, Major E. C., Newburgh.
Bradley, Geo. C., Watertown,
Bradley, S. W., Olean.
Breese, Ira L., Horseheads.
Breese, Ulysses, Horseheads.
Brick, A. H., Lowville.
Bristol, Wheeler H., Owego.
Brizee, Tunis, Pittsford.
Brodie, Wm. A., Geneseo.
Brooks, Daniel E., New York.
Brown, Alexander, New York.
Brown, D. D. S, Rochester.
Brown, Geo. D., Lowville.
Brown, Geo. H., Millbrook.
Brown, Henry K., Newburgh,
Brown, James, New York.*
Brown, James P., Utica.
Brown, Jesse, Jr., Jamaica.
Brown, John, Webb's Mills.
Brown, J. Carter, E. Greenwich, R. J.
Brown, John Crosby, New York.
Brown, J. Emery, Churchill.
Brown, J. Tilden, M. D., Bloomingdale.
Brown, Lewis B., New York.
Brown, Lewis M., New York.
Brown, Samuel H, Milbrook.*
Brown, William J., Fairhaven.
Brown, Wm. Smith, New York.
Bruen, Alexander M., Scarsdale.
Bryce, William, New York.
Bryden, Robert, New Hartford.
Buck. A. H., Lowville.
Buckley, Wade, Port Jervis.
Buell, William, Rochester.
Bulkley, D. A., Williamstown, Mass.
Burch, H. M., New York.
Burch, S. J., Bethlehem.
Burden, I. Townsend, Troy.
Burden, Jas. A., Troy.
Burdick, Orrin H., Auburn.
Burkhalter, Chas., New York.
Burr, Wm. M., Jr., Cazenovia.
Butler, B. C., Luzerne.
Butler, Chas, New York.
Butterfield, Charles E., Utica.
Butterfield, Daniel, New York.
Butterfield, John, Utica.*
Butterfield, John, Jr., Utica.
Butts, George, Manlius.
Byram, A. G., New York.

C.

Cady, Charles, Dryden.
Callanan, Henry, Albany.
Cameron, R. W., New York.
Camman, Herman H., New York.
Camp, Hugh N., New York.
Campbell, James K., D. D, New York.
Campbell, John, New York.
Campbell, John S., New York Mills.
Campbell, Samuel, New York Mills.
Campbell, Wm. Bayard, New York.
Canfield, Clarence W, Athens, Pa.
Canfield, Thos. W., Albany.
Cannon, Le Grand B., New York.
Cantwell, Thomas W., Albany.
Carpenter, Franklin, South Corinth
Carpenter, Isaac S., Shekomeko.
Carpenter, James, Wellsburgh.
Carr, Samuel M., Elmira.
Carroll, Chas. H., Geneseo.*
Cartter, David K., Rochester.
Cary, H. N., Whitesboro.
Case, Henry Jr., Auburn.
Case, Thos. R., Sinsbury, Conn.
Catlin, D. W., New York.
Chamberlain, D. D., New York.
Chamberlain, Frank O., Canandaigua.
Chamberlain, Olcott A., Richfield.
Chamberlain, Wm. L., Red Hook.
Chambers, James, Scarsdale.
Champlain, Marshall B., Cuba.
Champlin, Charles D., Hammondsport.*
Chapman, Crocker C., Hoosick Falls.
Chatfield, A. F., Albany.
Chatfield, T. I, Owego.

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Chauncey, Henry, Jr., New York.
Cheesboro, E., Albany.
Childs, J. Morris, Utica.
Childs, Silas D., Utica.
Chipman, Henry W., Chicago.
Chittenden, S. B., New York.
Chrystie, Albert N., Havre, France.
Church, Elihu, Riga.
Church, Richard, Belvidere.
Church, Walter S , Albany.
Churchill, A., Utica.
Claflin, Horace B . Brooklyn.
Clark, J. B., Elmira.
Clark, Leander, Newburgh.
Clark, Wm. J., Horseheads.
Clarke, Alfred, Springfield.*
Clarke, Almonde, Whitestone.
Clarke, George, Springfield.
Clarkson, Augustus, Potsdam.*
Clarkson, Levinus, Potsdam.*
Clarkson, T. Streathfield, Jr., Potsdam.
Clement, Isaac, Mechanicville.*
Coan, Luke, Westmoreland.
Coates, George, Elmira.
Cobb, Emory, Chicago.
Cocks, Isaac H., Old Westbury.
Coffin, Edmund, New York.
Cogswell, Wm. L , New York.
Cole, Walter, Batavia.
Coleman, Robert B , New York.
Collender, Hugh W., New York.
Congdon, George, Elmira.
Conger, A. B., Waldberg.
Conklin, John P., Saratoga Springs.
Converse, Geo. W., Winchendon, Mass.
Cook, E. G., Belleville.
Cooke, Rolland C., Whitehall.
Coon, Morell, West Edmeston.
Cooper, Joseph M., New York.
Copeman, A. S., Utica.*
Corey, John A., Saratoga Springs.*
Cornell, Alonzo B., Ithaca.
Cornell, Chas. Ezra, Ithaca.
Cornell, Ezra, Ithaca.*
Cornell, Franklin C., Ithaca.
Cornell, H. W., Albany.
Cornell, O. H. Perry, Ithaca.
Corning, Erastus, Albany.*
Corning, Erastus, Albany.
Corning, Erastus, Jr., Albany.
Cossitt, Davis, Onondaga.
Coulter, J. E., New York.
Cowdin, Elliott C., New York.
Cox, James W., Albany.
Crandall, Wm. De Loss, West Edmeston.
Crane, John J., Morrisania.
Crapo, John M., Albany.
Crawford, J. F., Syracuse.
Crego, Russell, Albany.
Crittenden, Norman, Ithaca.
Crocker, David, Jr., New York.
Crofoot, Jas. R., Constableville.
Cromwell, Wm., New York.
Crosman, C. F., Rochester.
Crosman, C. W., Rochester.
Crozier, Wm,, Northport.
Cunard, Sir Edward, New York.*
Cunningham. Jas. B , White Plains.
Curtis, Chas. E., Ithaca.
Curtis, De Witt C., Horseheads.
Curtis, E. L. B., Danby.
Curtis, Frank D., Charlton.
Curtis, George, Elmira.
Curtis, N. Martin, Ogdensburgh.
Curtis, R. E., Binghamton.

D.

Dagge, Edward, Rochester.
Dagwell, John, Utica.
Dalefield, John, Oakland.*
Dater, James, New York.
Dater, Philip, New York.
Davenport, Chas. L., Syracuse.
Davis, J. C. Bancroft, Newburgh.
De Angeles, W. W., Holland Patent.
Decker, David, Elmira.
Dederick, Levi, Albany.
Dederick, Peter K., Albany.
De Forest, D. W. C., De Freestville.
De Forest, Jacob J., Duanesburgh.
De Freest, John K., De Freestville.
De Freest, Martin D., De Freestville.*
De Graff, Alfred, Fonda.
De Grau, Aaron A., Jamaica, L. I.
Delafield, John, Oakland.*
Delamater, Cornelius H., Northport.
Delavan, Henry W., Ballston.*
De Long, M. B., Utica.
Demarest, Abram A., New York.
Dennistoun, Wm., New York.
Deuel, Stephen T., Little Rest.
Devereux, John C., Ellicottville.
Dewater, Wright, Elmira.

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Dewey, C. D., Port Leyden.
De Witt, Edward, New York.
Dexter, H. W., Newport, N. Y.
Dickey, Chas. D., New York.
Dickey, George, New York.
Didama, John E., Medina.
Dike, Henry A., New York.
Dike, James P., New York.
Dill, John B., Auburn.*
Dillon, Robert B., New York.
Dinsmore, Wm. B., Staatsburgh.
Diven, Alexander, Elmira.
Diven, Alexander S., Elmira.
Diven, Eugene, Elmira.
Dodge, Henry, Washington Mills.
Dodge, J. P. B., Esopus.
Dodge, Wm. E., New York.
Doelker, George, Albany.
Dollner, Harold, New York.
Doncaster, Daniel, Albany.
Doolittle, Chas. H., Utica.
Dorland, W. L., Dean's Corners.
Dounce, Wm. J., Elmira.
Douw, V. P., Albany.*
Downer, Chas., Utica.
Dows, Ammi, Charlton.
Dows, David, New York.
Doyle, Wm., Albany.
Draper, Simeon, New York.*
Dwight, J. W., Dryden.

E.

Earle, Morris, New York.
Eaton, Edward O., Troy.
Eckenberger, Haman, Elmira.
Eddy, John W., Saratoga.
Edmonds, F. W., Bronxville.
Edwards, Edward, South Corinth.
Elliott, John, New York.
Ellis, Edwin, Albany.
Ellis, John C., Schenectady.
Ellsworth, S. H., Starkville.
Ellwanger, George, Rochester.
Ely, Francis, Deansville.
Ely, Joseph E., Binghamton.
Ely, Wm. M., Binghamton.*
Emmett, Thos. Addis, Astoria.
Erwin, Chas. H., Painted Post.
Erwin, E. H., Painted Post.
Erwin, George Z., Potsdam.
Everett, Wm. E., Rye.

F.

Faile, Chas. V., New York.
Faile, Edward, New York.*
Faile, Edward G., New York.*
Faile, Henry, New York.*
Faile, Samuel, White Plains.
Faile, Thos. H., New York.*
Faile, Thos. H., Jr., New York.
Fairbanks, Erastus, St. Johnsbury, Vt.
Fairbanks, Horace, St. Johnsbury, Vt.
Fairbanks, Thaddeus, St. Johnsbury, Vt.
Farwell, Samuel, Utica.
Faulkner, Lester B., Dansville.
Faxton, Theo. S., Utica.
Fellows, Benjamin, Chili.
Fellows, Joseph, Bath.*
Ferguson, Amos, Utica.
Ferris, John, Moresville.
Ferris, Wm. L., Westchester.
Fields, P. H., Geneva.
Filley, Samuel R., Woodstock.
Finlay, J. Beekman, Saratoga Springs.*
Fish, Liberal C., Otego.
Fisk, Sanford N., Pine Valley.
Fitch, Asa, M. D., Salem.
Fitch, Mason P., Elmira.
Flagler, Benjamin, Suspension Bridge.
Forbes, Paul S., Greenbush.
Ford, Henry A., Westerlo.
Ford, William, Big Flats.
Ford, William F., West Davenport.
Foster, Edmund B., Stockbridge.
Foster, Frederick G., New York.
Foster, H. Ten Eyck, Lakeland.*
Foster, James S., New Hartford.
Fowler, C. Gilbert, Newburgh.
Fox, Eli, M. D., Mohawk.
Fox, George S., West Farms.*
Fox, William W., New York.*
Frame, William, Flushing.
Frazer, Kasson, Syracuse.
Freeman, Isaac, Bemis Heights.
Freeman, Jonathan W., Troy.
Freer, S. D., Cortlandville.
French, Henry C., Wells, Penn.
French, J. D. W., North Andover, Mass.
French, L. L., Page's Corners.
Frost, J. T., Clinton Point.
Frothingham, Wm. M., M. D., Washington Heights.
Fuller, D. B., New York.*

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Fulton, Levi S., Rochester.
Furman, John M., New York.

G.

Gaffers, Jeremiah, Newtonville.
Galbraith, Thomas, Washington Hollow.
Gallup, S. M., New York.
Gandy, Shephard, New York.
Gardenier, A. B., Niverville.
Gauley, William M., New York.*
Gaylor, Frank W., Nassau.
Geddes, George, Fairmount.*
Geddes, James, Fairmount.
George, Thomas, Newburgh.
Gibbs, J. E., Watertown.
Gibbs, R. B., Harpersfield.
Gibson, Richard, London, Can.
Gibson, William L., Elmira.
Gilbert, E. M., Utica.
Gilman, Arthur, Lee, Mass.
Gleason, R. S., West Troy.
Glenn, W. W., Baltimore, Md.*
Goewey, John A., Albany.
Goldsmith, Alden, Blooming Grove.
Goldsmith, R. F., West Southold.
Goodhue, J. C., Elmira.
Goodman, R., Lenox, Mass.
Gordon, Robert, New York.
Gould, David G., Quaker Hill.
Gould, John C., Albany.
Gould, J. Stanton, Hudson.*
Gould, Thomas, Aurora.
Graham, James H., Delhi.
Granger, Foster O., Saratoga Springs.
Granger, Gideon, Canandaigua.*
Granger, Oscar, Saratoga Springs.*
Grant, Israel P., Horseheads.
Gratzinger, Almon, Elmira.
Gray, Wm. H., Utica.
Green, Andrew H., New York.
Green, John C., New York.*
Greenman, Silas C., Utica.
Greenway, John, Syracuse.
Greer, Thomas H., Albany.
Gregory, H. C., Unadilla.
Greig, John, Canandaigua.*
Grice, C. C., V. S., New York.
Gridley, O. B., Deansville.
Griffin, Elihu, Clinton Corners.*
Griswold, Alpha D., Southport.
Griswold, John A., Troy.*
Grumman, William, Newark, N. J.
Gunn, Simeon W., Kirkland.

H.

Habirshaw, W. M., New York.
Hagan, William E., Troy.
Hager, John G., Rhinebeck.
Haight, Edward, Westchester.
Hall, F. G., Elmira.
Hall, Peleg, New York.
Hallett, J. S., New York.
Hamilton, David, Watervliet.*
Hamilton, William, Westmoreland.
Hand, Thomas J., Sing Sing.
Harberger, John S., New York.
Harder, Minard, Cobleskill.
Harison, Francis, D. D., Troy.
Harison, George D. L., New York.
Harison, Richard M., New York.
Harison, Thomas L., Morley.
Harold, John, Hempstead.
Harris, Joseph, Rochester.
Harrison, R. L., Hoosick Falls.
Hart, H. R., Utica.
Hart, William Howard, Troy.
Hartshorne, George, Rahway, N. J.
Haskell, William H., Albany.
Hastings, George F., Shushan.
Hatch, Lewis M., Asheville, N. C.
Haupt, Henry H., Dryden.
Havemeyer, Frederick C., New York.
Haven, John, Fort Washington.
Haviland, Isaac E., Hempstead.
Hawks, E. B., Wells Bridge
Hawley, J. S., Binghamton.
Hay, A. B., Troy.
Hayes, Clark I., Unadilla.
Hayward, Edwin S., Rochester.
Heath, Allen S., New York.
Heffron, D. S., Utica.
Hendrick, James, Albany.
Herrick, Elias H., New York.*
Herrick, Jacob B., New York.*
Herrick, John H., New York.
Herrick, Jonathan R., Albany.
Herring, Silas C., New York.
Hess, Elmon, West Somerset.
Heustis, Hugh, Adams.*
Hexamer, Frederick M., New Castle.
Heyne, Carl, Red Hook.*

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Hibbard, Charles, Sprout Brook.
Hicks, Benjamin D., North Hempstead.
Hill, David, Albany.
Hilton, James, New Scotland.
Hilton, Joseph, New Scotland.
Hilton, William J., Albany.
Hinkley, David J., Brookfield.
Hoadley, Luther, Harwinton, Conn.
Hodge, John, Lockport.
Hoe, Peter S., Tarrytown.
Hoe, Richard M., New York.
Hoffman, George W., Elmira.
Hoffman, Henry C., Horseheads.
Hoffman, Joseph, Elmira.
Hoge, William, Tarrytown.
Holbert, George W., Elmira.
Holbert, Joseph E., Chemung.
Holbert, Joshua S., Chemung.
Holden, Edward C., McGrawville.
Holmes, A. B., New York.
Holmes, Henry C., Quaker Springs.
Holmes, William M., Greenwich.
Hooker, Horace M., Cooperstown.
Hopkins, Henry, New York.*
Hopkins, Hiram P., Buffalo.
Hopkins, Lucius, New York.
Hopkins, Obadiah, New York.
Hopkins, William R., Utica.
Hotchkin, Samuel, Elmira.
Houghton, W. J., ———.
Housman, Chas. H., Valatia.
Hovey, C. M., Boston.
Howell, Benjamin H., New York.
Howland, Joseph, Matteawan.
Howland, Obadiah, Auburn.
Hoxie, Samuel L., South Edmeston.
Hoxie, Solomon, Whitesboro.
Hoyt, Alfred M., New York.
Hoyt, D. C., ———.
Hubbell, Alrick, Utica.
Hubbell, Eli S., Elmira.
Hull, Sylvester, Horseheads.
Hungerford, Solon D., Adams.
Hunt, Ward, Utica.
Hunt, Wilson G., New York.
Huntington, Benjamin N., Rome.
Huntington, Edward, Rome.
Hurlburt, H. A., New York.
Hurst, William, Albany.*
Husted, James W., Peekskill.
Hutchinson, Charles W., Utica.

I.

Ingalsbe, Grenville M., South Hartford.
Ingalsbe, H. H., South Hartford.
Ingalsbe, Jas. L., South Hartford.
Ingalsbe, Milo, South Hartford.
Ingalsbe, Royal, South Hartford.
Ingersoll, George, Charleston.
Irvin, Richard, New York.
Irwin, D. B., Middletown.
Isham, Wm. B., New York.
Ives, Julius, Geneva.
Ives, Julius, Jr., Geneva.

J.

Jackson, George, Albany.
Jackson, George P., Albany.*
Jackson, John C., New York.
Jaffray, Edward S., New York.
Jaques, Hiram N., Wright's Corners.
Jay, John, Katonah.
Jenkins, Jonathan H., Elmira.
Jervis, John B., Rome.
Jewell, A. L., Waltham, Mass.
Johnson, Benjamin P., Albany.*
Johnson, Benjamin W., Albany.
Johnson, Bradish, New York.
Johnson, Geo. W., Geneva.
Johnson, H. B., Afton.
Johnson, R L., Albany.*
Johnson, Samuel William, Ellicottville.
Johnson, William, Seneca.*
Johnson, Jas. Boorman, New York.
Johnston, John T., New York.
Johnston, William S., Poughkeepsie
Jones, David R. Floyd, South Oyster Bay.*
Jones, Edward, Rhinebeck.
Jones, Ira A., Breesport.
Jones, John W., Elmira.
Jones, Morris R., Rome.
Jones, O. W., New York.
Jones, Richmond, Elmira.
Judd, Orange, New York.
Juliand, Joseph, Bainbridge.

K.

Kane, W. H., New York.
Keays, Edward, Albany.
Keeler, Edw. Elmer, Danby.
Keene, S. S., M. D., New York.

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Keese, Samuel T., New York.
Kellogg, P. V., Utica.
Kelly, Henry, New York.*
Kelly, Patrick, West Troy.
Kelly, William, Rhinebeck.*
Kelly, William, Jr., New York.
Kennedy, R. Lenox, New York.
Ketchum, Morris, New York.
Kidder, K. P., Burlington, Vt.
Kincaid, Jas. C. P., Utica.
King, John A., Jamaica.*
King, John A., Jr., Great Neck.
King, Peter V., New York.
Kingsland, Thomas B., New York.
Kirby, William A., Auburn.
Kirke, George Wistar, New York.
Kirtland, B. B., Greenbush.*
Knickerbocker, Danl. M., Albany.

L.

Labishiner, Emmanuel, Albany.
Lambert, William G., Jr., Chappequa.
Landon, William, Albany.*
Lane, George W., New York.
Langdon, Charles J., Elmira.
Langworthy, Hollum, West Edmeston.
Langworthy, Irwin, South Brookfield.
Lansing, Charles, Lansingburgh.
Lathrop, Ariel, Albany.
Lathrop, Daniel S., Albany.*
Lawrence, De Witt C., New York.
Lawrence, Edward A., Bayside.
Lawrence, F. N., Flushing.
Lawrence, Lewis H., Utica.
Lawyer, Luther, Perch River.
Lay, Frederick W., Greece.
Leach, Almon, Utica.
Leavitt, Henry S., New York.
Ledyard, L. W., Cazenovia.
Lee, David B., New York.
Lee, John R., Buffalo.
Lee, William, Schenectady.
Lee, William H., New York.
Leggett, Edward W., Harlem.*
Leland, Charles E., Saratoga Springs.
Leland, Simeon, New York.
Leland, Walter W., Saratoga Springs.
Lenox, James, New York.
Leonard, Moses G., Rockland Lake.
Le Ray de Chaumont, James, Le Rayville.*
Leverich, Charles D., Newtown.
Leverich, Charles P., New York.
Lewis, Harris, Frankfort.
Lewis, John G., Frankfort.
Lewis, Oscar J., Schodack Centre.
Lexow, Rudolph, Nanuet.
Liantard, A. F. (M. D.), New York.
Linklaen, Ledyard, Cazenovia.*
Littlefield, R. M., Afton.
Livermore, Charles F., New York.
Livingston, Edward P., Clermont.*
Livingston, Hiram, Albany.*
Livingston, John Henry, Clermont.
Livingston, Robert, Jr., New York.
Locke, James S., Millport.
Lockwood, E., New York.*
Lockwood, G., New York.*
Look, S. J., Clayville.
Loomis, H. B., New York.
Lord, H. G., ———.
Lord, J. Cooper, New York.*
Lorillard, L. S., New York.
Lormore, William J., Elmira.
Lovell, Reuben, Elmira.
Lowber, Robert W., New York.
Ludlow, William H., Sayville.
Lyman, David, Middlefield.
Lynd, George P., Albany.

M.

McCall, James S., Geneva.
McCann, George S., Elmira.
McCann, James, Elmira.
McCann, James, Jr., Elmira.
McCann, John, Elmira.
McCarthy, Patrick, Albany.
McCarthy, Thomas, Albany.
McCredy, Dennis A, New York.*
McDougal, Gen. C. D., Auburn.
McGraw, John, Ithaca.*
McGraw, Joseph, Dryden.
McGraw, Thomas, Albany.
McHarg, John W., Albany.
McIntyre, Archibald, Albany.*
McIntyre, J. McDonald, Linlithgow.
McKinney, James, Albany.
McNeil, R. C., Campville.
McNish, Charles W., Horseheads.
Macomb, John Navarre, Jr., Branchport.
Magone, Daniel, Ogdensburg.
Mahar, Michael, Millbrook.

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Mairs, James W., Schenectady.
Maitland, Robert L., New York.*
Maitland, William C., Fordham.
Mann, J. F., Utica.
Marcy, John S., Riverhead.
Marks, Enoch, Camillus.
Martin, William R., New York.
Martyn, Albert T., Canton.
Marvin, James M., Saratoga Springs.
Mason, Daniel C., New Hartford.
Mason, John W., Brooklyn.
Mason, S. M., New Hartford.
Masterton, Alexander, Boonville.
Masterton, Robert M., Bronxville.
Mather, F. E., New York.
Mather, Joshua, Utica.
Mathewson, Park, New York.
Matteson, James M., Jacksonville.
Matteson, O. B., Utica.
Matthews, Charles, West Troy.
Matthewson, J. E., New Berlin Centre.
Mattoon, William, Springfield, Mass.
Mauran, S. E., White Lake.
Maxon, G. G., Schenectady.
Maxon, Thomas V., Adams.
Maxwell, Hugh, New York.
Mecke, John A., New York.
Mekeel, Abram V., North Hector.
Melick, William B., Albany.
Merchant, Abel, Nassau.
Merriam, Charles M., Leyden.
Merriam, Clinton L., Leyden.
Mesick, Peter, Albany.*
Messenger, Thomas, Great Neck.*
Messenger, W. S., Great Neck.
Meyer, Theo. F. M., New York.
Middleton, Robert, Utica.
Millard, S. A., Clayville.
Miller, Brayton B., Leyden.
Miller, Charles D., Geneva.
Miller, Dudley, Oswego.
Miller, Daniel S., New York.
Miller, Gerrit S., Peterboro.
Miller, James M., New York.
Miller, Peter, Fredonia.
Miller, Seth, Constableville.*
Mills, George F., Fonda.
Mills, James R., Albany.
Mills, M. H., Rochester.
Minturn, Robert B., New York.
Mitchell, O. M., Saratoga Springs.*
Mitchell, Samuel L., New York.
Mixter, David E., Jordanville
Moffatt, John N., New York.
Moller, William F., Irvington.
Moon, C. B., Saratoga Springs.
Moore, D. D. T., Rochester.
Mordoff, M. C., Rochester.
Morgan, Henry A., Aurora.
Morgan, J. E., Deerfield.
Morrell, Robert, Manhasset.
Morris, A. Newbold, Barton.
Morris, Francis, Fordham.
Morris, Fordham, Fordham.
Morris, Lewis G., Fordham.
Morrison, James M., New York.
Morss, B. G., Red Falls.
Mortimer, John H., New York.
Mount, Andrew, New York.
Mowry, J. F., Deansville.
Munn, Samuel, Mott Haven.
Munroe, Allen, Syracuse.
Munson, E., Tyre.
Murray, George, New York.
Musselman, Chauncey, Phelps.
Myers, John K., Yonkers.
Myers, Marvin E., Charlton.

N.

Neish, William, Hamden.
Nellis, A. J., Bath.
Nelson, George P., Scarsdale.
Newton, William, Henrietta.
Norman, Thomas E., Albany.
Norton, Robert, New York.
Nourse, J., Boston, Mass.
Nusbaum, Israel, Albany.

O

O'Brien, B., Albany.
Odell, William T., Ballston.
Ogden, Gouverneur M., New York.
Ogden, William B., High Bridge.*
Oliver, Robert S., Albany.
Olmsted, Henry M., Morristown, N. J.
Osborn, Amos O., Waterville.
Osborn, Charles W., Albany.
Osborn, John W., Albany.
Osborne, David M., Auburn.
Osborne, John H., Auburn.
Osgood, Jason C., Troy.

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Ostrander, W. P., Schuylerville.
Otis, H. G., Geneva.
Owen, Henry W., Chemung.
Owen, Jesse, Chemung.

P.

Page, John R., Sennett.
Palmer, Allen B., Geneva.
Palmer, A. S., Albany.
Palmer, A. W., Amenia.
Palmer, J. L., Adams Centre.
Palmer, N., Hudson.
Palmer, T. G., Hudson.
Park, Joseph, New York.
Parke, H. S., New York.
Parker, Amasa J., Jr., Albany.
Parks, Jonas, Horseheads.
Paton, Thomas, New York.
Paton, William, New York.
Patrick, Marsena R., Manlius.
Patterson, Albert M., Geneva.
Pearsall, N. B., Morris.
Pease, James D., Trumansburgh.
Pease, Richard H., New York.
Peck, Benj. F., East Bethany.
Peck, Edgar F. (M. D.), Brooklyn.
Peebles, W. A., Martinsburgh.
Peet, Harvey P., New York.*
Peet, Isaac Lewis, New York.
Pell, Robert L., Pelham Farm.
Pellew, Henry E., Katonah.
Penfold, Edmund, New York.*
Penfold, E., Jr., New York.
Penfold, William Hall, New York.
Perkins, T. E., Providence, R. I.
Perry, John S., Albany.
Peters, T. C., Darien.*
Peugnet, Charles, Cape Vincent.
Phelps, Peter, Derby, Conn.
Phelps, Royal, New York.
Phelps, Thomas W., New York.
Phillips, Marcus H., Orleans.
Pierson, Henry L., New York.
Pierson, Henry R., Albany.
Pinckney, Stephen R., New York.
Pine, Ai, Pittstown.
Pine, George W., Herkimer.
Pinkney, Thompson, Bronxville.
Platt, James N., New York.
Plumb, Josiah B., Albany.
Pomroy, William H., New York.
Popham, William H., Scarsdale.
Post, William, New York.*
Potter, Cranston B., Elmira.
Potter, Howard, New York.
Potter, Lewis, Easton.
Pratt, Russell W., Fort Edward.
Pratt, Zadock, Prattsville.*
Prentice, Ezra P., Albany.*
Prentiss, J. H., Utica.
Prescott, T. A., Sandy Hill.
Price, George H., Albany.
Priest, D. E., Utica.
Priest, Zenas C., Utica.
Proctor, Thomas R., Utica.
Pumpelly, Harmon, Albany.*
Punnett, James, New York.*
Purdy, Samuel M., West Farms.
Pye, Edward, Haverstraw.*
Pyle, James, New York.

R.

Ramsdell, Homer, Newburgh.
Ramsdell, L., Greenville.
Randall, Benjamin, Adams.
Randall, Henry S., Cortland.*
Randall, Nathan, Syracuse.
Randall, N. W., Bristol Centre.
Rankin, William, Charlotte.
Rathbone, George, New London.
Rathbone, John F., Albany.
Rathbun, John T., Elmira.
Rathbun, L. W., Springfield.
Ray, Wesley W., Honeoye, N. Y.
Read, James H., Utica.
Read, J. Meredith, Albany.
Read, William G., New York.
Redfield, Frank B., Batavia.
Reed, Almet, New York.
Reeve, John H., Wells' Corners.
Reeves, Wellington C., Horsehead.
Reid, James R., Elmira.
Remington, Eliphalet, Cazenovia.
Remington, M. C., Weedsport.
Reynolds, M. F., Rochester.
Reynolds, Samuel T., Elmira.
Richardson, Thomas, West Farms.*
Richards, N. C., Fort Washington.
Rider, Zerah, Cambridge.
Riggs, C. G., Turin.
Ripley, Joseph, New York.
Robbins, George A., New York.

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Robinson, Charles, Fishkill Plains.
Robinson, Chauncey N., Elmira.
Robinson, Henry, Newburgh.
Robinson, John A., Elmira.
Rockwell, A. B., Elmira.
Rockwell, Daniel B., Horseheads.
Rockwell, H. Fletcher, Horseheads.
Rockwell, John B., Elmira.
Rockwell, Jonathan, Pine Valley.
Rockwell, S. D., New York.
Rodgers, L. M., Newtonville.
Rogers, Daniel E., Wheatland.
Rogers, Henry W., Buffalo.
Ronan, Patrick, Elmira.
Root, Samuel, Westport.
Rose, David, Albany.
Rotch, Francis, Morris.*
Rotch, Francis M., Morris.*
Rowe, Jacob, Poughkeepsie.
Runyan, Vincent L., Seneca Castle.
Rust, Philio N., Syracuse.*
Rutherford, Thomas H., Eastchester.*
Rysdorph, Lawrence, Greenbush.

S.

Safford, Halsey, East Otto.
Sampson, George G., Brooklyn.
Sanders, J. H., St. Johnsville.
Sanders, Walter T. L., Schenectady.
Sanford, Charles, Schenectady.
Sands, A. B., New York.*
Sanford, George H., Schenectady.*
Saunders, Thomas P., Adams.
Savage, Charles, Elmira.
Savage, Thomas, New Hartford.
Saxton, C. M., New York.
Sayre, Willis B., Horseheads.
Schenck, William J., New York.
Schoonmaker, Henry, Cedar Hill.
Schreiner, O. H., New York.
Schultz, Jackson S., New York.
Schuyler, Gerritt L., Watervliet.
Schuyler, Isaac L., Watervliet.
Schuyler, Peter C., New York.
Schuyler, Philip S., Watervliet.
Schuyler, Richard P., West Troy.
Scott, John H., New York.
Scoville, J. V. H., Paris.
Seaman, P., Newburgh.
Seegur, Hiram, Adams.
Seeley, D. W., Albany.
Selkreg, John H., Ithaca.
Seney, George I., New York.
Seward, William H., Auburn.*
Seymour, Horatio, Utica.
Seymour, John F., Utica.
Shanahan, James, Tribes Hill.
Shark, Anthony, De Freestville.
Sharp, Jacob, Rome.
Shattuck, Lewis H., Westmoreland.
Shaw, George, Deerfield.
Shaw, Patrick H., Albany.*
Sheafe, John Fisher, New Hamburgh.
Sheldon, Henry K., New York.
Sheldon, James, Geneva.
Sheldon, James O., Geneva.
Sheldon, Lucius M., Brooklyn.
Sherman, Benjamin B., New York.
Sherman, B. L., New York.
Sherman, C. A., New York.
Sherman, Ira E., Sidney Plains.
Sherman, Samuel, Lundey's Lane.
Sherman, William C. H., Newburgh.
Sherrill, E., New Hartford.
Sherrill, Eliakim, Geneva.*
Sherrill, Lewis, Greenville.
Sherwood, Frederick, New York.
Sherwood, John M., Auburn.*
Shonnard, E. F., Yonkers.
Simpson, George G., Brooklyn.
Simpson, J. B., Jr., New York.
Simpson, John V., West Farms.
Simpson, William, West Farms.
Simpson, William, Jr., New Hudson.
Simpson, ——, White Plains.*
Sisson, George M., Genoa.
Slee, John D. F., Elmira.
Slingerland, William H., Normanskill.
Sloan, Samuel, New York.
Smead, Dr. C. D., Logan.
Smith, Albert, New Rochelle.
Smith, Daniel D., New York.
Smith, N. Everett, New York.
Smith, Gabriel L., Elmira.
Smith, J. Wesley, Albany.
Smith, Lewis M., Elmira.
Smith, M. M., Lowville.
Smith, Silas G., Mechanicville.
Smith, Solomon P., Waterford
Smith, Thomas, New York.
Smith, W. Harrison, Geneva.
Smull, Thomas, New York.*

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Soule, Alexander C., Syracuse.
Southworth, John, Dryden.*
Southworth, John Ellis, New York.*
Southworth, ——, Utica.*
Spaulding, Henry F., New York.
Spencer, J. E., Utica.
Spencer, Lorillard, Westchester.
Spinner, John D., Herkimer.
Spoffard, Eugene W., Elmwood.
Spofford, Joseph L., New York.
Spofford, Paul, New York.*
Spriggs, J. Thomas, Utica.
Staley, Daniel G., Albany.
Standring, L. S., Deer River.
Stanford, Charles, Schenectady.
Starin, John H., Fultonville.
Stephens, Henry F., Syracuse.
Stephenson, George S., New York.
Stetson, Charles A., New York.
Stevens, E. R., Saratoga Springs.
Stevens, S. W., Rochester.
Stillman, Charles, Woodstock.
Stockwell, S. S., New York.
Stoddard, Increase B., Horseheads.
Stoddard, Joshua C., Lockport.
Strong, Benjamin W., Newtown.
Story, Richard J., Greenbush.
Story, Richard R., Albany.
Stuart, Alexander, New York.
Stuart, Robert L., New York.
Sturgis, Jonathan, New York.
Sturtevant, E. Lewis, M. D., South Framingham, Mass.
Stuyvesant, John R., Poughkeepsie.
Suffern, Andrew, Elmira.
Suffern, John, Elmira.
Sutherland, J. H., Pittsford.
Suydam, Henry, Jr., New York.*
Swain, James P., Bronxville.
Swain, Thomas M., Bronxville.
Swan, Benjamin L., Jr., Oyster Bay.
Swan, Robert J., Geneva.
Swan, William H., New York.
Sweeney, Capt. A. H., Albany.
Sweet, Anson A., Syracuse.
Sweezy, George W., New York.

T.

Taber, Samuel T., Roslyn.*
Tallmadge, Samuel, Valatia.
Tappan, John L., New York.*
Taylor, Edwy L., Albany.
Taylor, E. W., Elmira.
Taylor, John W., ——.
Ten Broeck, Walter L., Rhinebeck.
Terry, Edmund, Utica.
Thayer, Adin, Hoosick Falls.
Thomas, Burton A., Sand Lake.
Thomas, Herman, Saratoga Springs.
Thomas, Jeffrey P., Albany.
Thomas, John, Frankfort.
Thompson, Frederick, New York.
Thompson, James, Ballston.
Thompson, Samuel L., Setauket.
Thorne, Edwin, Millbrook.
Thorne, Jonathan, New York.
Thorne, Samuel, New York.
Thorne, Stephen, Utica.*
Tibbetts, Lester G., New Scotland.
Tifft, Reuben, Pine Valley.
Tillman, Mrs. Emeline, Elmira.
Titus, Charles M., Ithaca.
Titus, James H., Malone.
Tobey, Arthur, Pittsford.
Tobey, Reuben, Pittsford.
Tobey, Silas W., Hudson.
Tomes, Francis, Jr., New York.
Tompkins, Daniel D., Medina.
Toole, William S., New York.
Townsend, John, Albany.*
Tripp, Lemon B., North Castle.
Tucker, Luther, Albany.*
Tucker, Luther H., Albany.
Turner, Benjamin, Horseheads.
Turner, David, Veteran.
Turner, David J., Horseheads.
Turner, Stephen J., Horseheads.
Tweddle, George, Baltimore, Md.
Tweed, William M., New York.*
Tyler, Joel, Springwater.

U.

Underhill, Daniel, Jericho.
Underhill, Richard T. (M. D.), Croton Landing.
Underwood, G. F., ——
Upham, A. S., Le Roy.

V.

Vail, George, Troy.
Van Allen, Edwin, Bethlehem.

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Van Alstyne, P. Edward, Kinderhook.
Van Antwerp, John, New York.
Van Benthuysen, Arthur L, Albany.*
Van Benthuysen, Charles, Albany.*
Van Benthuysen, Charles H., Albany.
Van Buren, William H. (M. D.), New York.
Vanderveer, Theodore B., Amsterdam.
Vanderveer, George, Port Jackson.
Van Deusen, H. A., Sprout Brook.
Van Duzer, Jonas S., Horseheads.
Van Duzer, William H., Horseheads.
Van Gorder, Robert B., Elmira.
Van Hoesen, John L, Castleton.
Van Horn, G. H. F., Fonda.
Van Horn, Levi, Minaville.
Van Orden, William H., Catskill.
Van Pelt, Henry, New York.
Van Rensselaer, Robert H., Morris.
Van Rensselaer, Stephen, Albany.*
Van Rensselaer, Stephen, Jr., Albany.*
Van Rensselaer, William P., Albany.*
Van Vranken, William, Schenectady.
Van Waganen, Jared, Lawyerville.
Van Wie, Peter, Cedar Hill.
Vick, Frank H., Rochester.
Vick, James, Rochester.
Viele, Maurice E., Albany.
Visscher, John, Elmira.
Voight, August, Elmira.

W.

Wackerhagen, E., Greenville.
Wade, Elias, Jr, New York.
Wadsworth, Charles F., Geneseo.
Wadsworth, Craig W., Geneseo.*
Wadsworth, James, Geneseo.*
Wadsworth, James S., Geneseo.*
Wadsworth, James W.., Geneseo.
Wadsworth, William A., Geneseo.
Wadsworth, William W., Geneseo.*
Wagstaff, Alfred, Jr., Babylon.
Wainright, Charles S., Rhinebeck.
Wait, David, Wells' Bridge.
Walbridge, D. T., Rochester.
Walcott, W. D., New York Mills.
Walker, Charles C. B., Corning.
Walker, C. E., Corning.
Walker, William E., Schenectady.
Walrath, Solomon, Rensselaer Falls.*
Ward, Frank D., Le Roy.
Ward, John, New York.*
Warner, Daniel D., Canaan.
Warner, George H., New York Mills.
Warner, Horatio G., Rochester.*
Warren, J. Hobart, Hoosick Falls.
Watson, H. M., Buffalo.
Watson H. R. C., West Farms.
Watson, William, West Farms.*
Watson, W. H., Medina.
Watts, John, Ithaca.
Weed, Willian H, New York.
Weed, William W., Buffalo.*
Weld, Mason C., New York.
Welles, John C., Athens, Pa.
Welles, M. H., Elmira.
Wells, Edward, Johnstown.
Wells, Eugene, Rhinebeck.
Wells, Henry, Aurora.
Wemple, Edward, Fultonville.
Wemple, Robert, Fultonville.
Wende, B. A., Alden.
Wende, Herman, Alden.
Wendell, Buzz, Cazenovia.
Wendell, Charles, Albany.
Wendell, Edward A., Albany.
Wendell, Herman, Albany.
Wendell, James V., Albany.
Westlake, John F., Horseheads.
Weston, Frederick, Sandy Hill.
Wetmore, Benjamin C., New York.
Wetmore, Prosper M., New York.*
Wheeler, Cyrenus, Jr., Auburn.
Wheeler, G. H., Hammondsport.
Wheeler, James A., Pine Valley.
Whipple, William, Medina.
White, Hollis, Niagara Falls.
White, Hugh, Waterford.*
White, Rufus P., Adams.
White, William M., Canaseraga.
Whitlock, Benjamin M., West Farms.*
Whitney, Cheney P., Orleans.
Whitney, George J., Rochester.
Whitney, James, Horseheads.
Whitney, Orla H., Mexico.*
Wier, Henry, Johnsonville.
Wier, H. C., Sugarloaf.
Wight, R. A., New York.
Wilbur, Royal P., Lowville.
Wilcox, A. F., Fayetteville.
Wild, W. H., Niverville.

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Wilkin, J. W., Goshen.
Willard, G. L., Cold Spring Harbor.
Willard, X. A., Little Falls.
Willers, Diedrich, Jr., Varick.
Willets, Robert, Flushing.
Willets, Samuel, New York.
Williams, Josiah T., Chappaqua.
Williams, J. B., Ithaca.
Williams, J. E., New York.
Williams, Samuel Lloyd, Perrinton.
Wilson, Benton H., Syracuse.
Wilson, Catlin, Eutaw, Ala.
Wilson, Charles S., Utica.
Wilson, James H., Whitesboro.
Wing, John D., New York.
Winne, Jurian, Bethlehem.
Wolcott, S G., M. D., Utica.
Wolfe, John David, New York.*
Wolfe, N. H., New York.
Wood, Almon H., Utica.
Wood, Amos F., Woodville.
Wood, E. D., Utica.
Wood, Frank, Hoosick Falls.
Wood, John E., Middletown.
Wood, Oren S., Montreal.
Wood, W. Anson, Hoosick Falls.
Woodford, Francis T., Utica.
Woodward, Jabez S., Lockport, N. Y.
Woodruff, Franklin, Brooklyn.
Woodworth, Augustus P., New York.
Wurtz, Charles Stewart, Philadelphia, Pa.
Wyckoff, S. S., New York.*

Y.

Yelverton, Robert, New York.
Young, George, Utica.
Youmans, George, Delhi.

Z.

Zborowski, Martin, Morrisania.*

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CONTAGIOUS DISEASES OF ANIMALS AND THE NEED OF PROTECTIVE LEGISLATION.

A Paper read before the Society, January 16, 1878,
By JAMES LAW, M. R. C. V. S.,
Professor of Veterinary Science in Cornell University.

Two years ago I availed myself of the opportunity of our Annual Meeting, to call attention to the imported and indigenous diseases of animals, that prove infectious or communicable, and to the great need of legislative measures for their extinction. To-day we are still left in the same unprotected condition, and in view of the enormous interests, present and prospective, involved in this subject, I think I cannot now do better than reiterate the warning and urge to action, mainly by the consideration of the practical lessons that have been spread out before us in the interval.

I base the claims of this subject, to the most careful consideration, on the truths, that first, the permanent prosperity of any nation, must finally rest upon her agricultural resources; and second, that the permanent fertility of every soil will be in direct ratio to the numbers of live stock kept on a given area. I might go further and say that no branch of agriculture is more closely connected with man's physical well-being and social progress than in the case of stock.

In the earliest historic records man's supremacy in the creation is sought by his subjugation of other living creatures. "Be fruitful and multiply and replenish the earth and subdue it, and have dominion over the fish of the sea, and over the fowls of the air, and over every living thing that moveth upon the earth." GEN. i: 28. In keeping with this, all advances in civilization have been contemporary with the domestication of animals.

The untutored savage subsists by hunting wild animals, and if he domesticates any, it rarely goes further than a dog, which he trains to assist him in securing his prey. He makes a mighty stride towards civilization when he domesticates the herbivora and omnivora, and keeps them in flocks and herds to furnish milk and cheese, or meat, for the support of himself and his family. At once the idea of property is introduced. Upon this is based that of just mutual rela-

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tions between man and man, the germ and source of all law and government. If we advance still further, to the cultivation of the soil, the one lasting foundation of national wealth, and that which occupies four-fifths of the population in all self-supporting countries, we find in the live stock new and hitherto unappreciated merits, for to them we must now look for the labor of culture, and to them for the manurial returns which will secure a permanent fertility. The continued fruitfulness of any country may be predicated on the number of domestic animals it supports, and the speedy exhaustion of any soil subjected to cropping, on the absence or paucity of these natural fertilizers.

In all the ancient civilizations, we find indications of the great care bestowed on the animal creation. The Parsees and Hindoos had their veterinary physicians, their books on veterinary art (Avirslie), and their hospitals for animals, some of which continue to the present day. The Persians and Arabs have always been famed for the excellence of their horses, and for their care in breeding and management, and there is a statement extant of a Sanscrit work on the subject, dating as far back as the Babylonian Empire (Quatremère). Egypt, the representation, perhaps, of the most ancient civilization of all, has old paintings representing veterinarians treating oxen, gazelles and fowls, with inscriptions underneath descriptive of their occupation. The Greeks, in whom all the old civilizations culminated, are the first to have left us distinct treatises on the veterinary art. Hippocrates, Diocles and Aristotle mention this profession, and give evidence of their having profited largely by dissecting animals, and observing their diseases. Mago, of Carthage, in his great work on Agriculture, appears to have treated of the diseases of animals, and notably of Orthonœa of horses, probably our familiar heaves. These were followed by a host of others, among whom the most renowned were Varro, Columella, Pelagonius, Palladius and Apsyrtus. The influence of the Roman conquests was to introduce a belief in charms, incantations and other superstitious rites, and the effeminate luxury of that period, and finally the decline of the empire proved the temporary grave of veterinary science. It was restored somewhat with the revival of art in Italy in the twelfth century, and received a great impetus in the sixteenth from the labors of Carlo Ricini, who appears to have anticipated Harvey's famous discovery of the circulation of the blood.

But it has been reserved for the eighteenth century, and notably for the nineteenth, to found and sustain veterinary schools in all the

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countries of the Old World, to subject the veterinary art to the strict principles of modern science, to render deadly regions salubrious, and to carry out comprehensive measures for the exclusion and extinction of their animal plagues, which have been the terror and the scourge of the Continent.

Much of the backward agriculture of different nations of Europe may be justly charged upon their plagues, which extended at frequent but irregular intervals over their fair fields, swept off their flocks and herds as with the blast of destruction, robbed the land of their natural fertilizing products, and left the farmer with insufficient stock for the cultivation of his land, and the securing of his harvests. Much of the agricultural glory of England is due to her insular position, which, until recently on the inauguration of free trade in stock, habitually saved her from these disastrous pestilences, secured the unrestricted increase of her native stock, preserved ample numbers for the cultivation of the soil, and the manufacture of an abundance of home-made fertilizers, and allowed of the perpetuation and enhancement of those noble qualities which have made English live stock the wonder and envy of the world. Even in our Southern States we read a similar lesson. Where cotton and tobacco have excluded the live-stock element, we find the natural results in the exhaustion and abandonment of many farms that, under a judicious system of mixed live-stock husbandry, should have steadily advanced in fertility.

It was the terrible incubus of those frequent pestilential depletions of the live stock upon agricultural and national prosperity in Continental Europe that led, in 1761, to the establishment of the first veterinary college of modern times, that of Lyons, under the patronage and support of the French monarch. His wise example was speedily followed by others, and now every country of Continental Europe has its veterinary college or colleges under government support and control. Lulled into false security by her insular position, England alone has lagged behind, and while her great wealth in live stock has stimulated to the production of four veterinary schools, these have been simply private enterprises, and no attempt has been made to affiliate or subordinate them to the State, or to avail of the national protection which they ought to have furnished.

The fancied security of the British Isles was first rudely shaken in 1842, when, in connection with the "Free Trade Act," her shores were deluged with continental stock, and when the deadly *lung fever of cattle*, which had already crept unsuspected into two parts of her

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borders, was thrown upon her in daily and weekly accessions. This was speedily followed by the less fatal, but no less ruinous *aphthous fever*, later still by the destructive *sheep-pox*, and lastly, in 1865, by the dread *rinderpest*. From the first two diseases she lost over $400,000,000 in actual deaths in a third of a century, and from the last more than $40,000,000 in *eighteen months*. The two first still continue their ravages with unabated fury, while the more speedily fatal *rinderpest* and *sheep-pox* have repeatedly roused the nation to a vigorous and successful effort for their extermination. Yet even the successful efforts of England have been made at a most extravagant outlay, and in an unnecessarily tardy manner, owing to her neglect of *veterinary science* and the keeping aloof of her government from the veterinarian schools.

Thus the path of the *rinderpest* last year on its way to England, was through Prussia, where the disease showed itself notably in the Harz Mountains, in Saxony. No sooner was the discovery of the invasion made than the Prussian authorities apprized England that suspicious cattle had been shipped to her shores, and at the same time applied the most stringent measures for the suppression of the plague within her own boundaries. As usual with the Prussian Veterinary Sanitary Administration, these measures were of the most rigorous and far-reaching kind, and in little over a week the disease was extinguished. In England, on the other hand, where no sufficient measures were prepared for such an emergency, the outbreak was met by little more than a tentative policy, and meanwhile a committee from both houses of Parliament, was appointed to consider the best means to be adopted. In this way several months were consumed; while the disease continued to smoulder, and burst out afresh in different localities, the imperfect inspection and control of the movements of live stock were continued at unnecessary expense, the cattle trade was thrown into confusion. No stock owner knew where his property would be safe, and where he might meet with disaster, and finally when the parliamentary committee had been sufficiently educated in the nature of the malady, they issued what was considered advice suitable for its extinction.

It is true, that this grows out of that which is the crowning glory of England, her free institutions, and the supremacy of her parliamentary body, and that the United States, from a similar cause, is beset by precisely the same danger.

Indeed, the futile measures resorted to by our government, in the face of this threatened invasion of *rinderpest*, is a fitting sequel to

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the English experience, and another commentary on what I may call the *Anglo-Saxon system*. When apprized that Western Europe and England had been invaded by *rinderpest*, our Treasury Department, with commendable alacrity, issued an order to the custom authorities, with the view of excluding the plague from our shores. This order ought to be carefully studied by every stock-owner as a specimen of the work to be expected from well-meaning officials, who are ignorant of the subject they are dealing with.

"CIRCULAR."

IMPORTATION OF LIVE STOCK.

TREASURY DEPARTMENT,
WASHINGTON, D. C., *March* 22, 1877.

1877. DEPARTMENT No. 42, SECRETARY'S OFFICE.

To Collectors and other Officers of the Customs:

The prevalence of the *rinderpest* in Germany, and of that malady, and the *foot and mouth disease* in England, has led this department to prohibit the importation of *neat cattle* and the *hides of neat cattle* from these countries into the United States.

By reason of the proximity of Holland and Belgium to Germany, and of Ireland to England, the prohibition is hereby extended to embrace such importations from these countries.

The department is informed that the *rinderpest* is infectious as well as contagious, and that sheep, horses and swine may be *media* for its communication. It is also understood that the litter, on which these animals sleep, spreads the disease.

While the department has no authority under the law to prohibit the importation of horses, sheep and swine, it desires that all measures practicable be taken on the arrival of such animals from the countries named, to prevent the possibility of contagious diseases being communicated thereby to stock in the United States.

It is suggested that horses, sheep and swine, coming from any of the countries named, be examined by experts, and if necessary quarantined for a reasonable time, to which I apprehend that importers, as a rule, will offer no special objection, as it is to the interest of all concerned to prevent the spread of this disease in the United States.

You will take such action in cases of this character, as in your judgment will be necessary.

Blooded stock, coming from the countries named, may be admitted when accompanied by a consular certificate of non-infection, as author-

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ized by department letter of 16th of March last, it being presumed that such stock is selected with care, and that it would not be taken from herds infected with the diseases mentioned.

JOHN SHERMAN,
Secretary.

We have here a provision against the importation of cattle and hides, but no precaution against the landing of fodder, litter, blankets, or utensils used by the sick, or suspected animals, nor of wool, any of which may be the means of importing the disease.

Then, in conclusion, the order guarantees the entrance of all thorough-bred or blooded stock, if accompanied by a certificate of soundness from an American Consul. Here, at one stroke, is swept off every guarantee of safety, which the order would otherwise provide. No importer will consciously invest his money in unsound stock, nor run the risk of bringing suspicious cattle across the Atlantic. The fact of importation is thus an even better guarantee of soundness than a consular certificate. The danger lies mainly in the risk of contracting the poison on railway cars, or on the quays when being shipped. This can only be safely met by an examination and quarantine on their arrival, and after they have spent ten days of incubation of disease on board ship. Then, as to the comparative safety of blooded stock. First. None other is imported. Second. All our importation of European cattle diseases have taken place with blooded stock. Our three recorded importations of the *lung fever* were in blooded English and Holstein cows, and the two known importations of *aphthous fever* into Canada, were in Shorthorn cattle and thoroughbred English sheep. If we go to other countries we find a similar record. *Lung fever* was carried to the Cape of Good Hope and Australia by Shorthorn cows, and to Denmark, Sweden and Oldenburg by Ayrshires. Here, then, our excellent Secretary of the Treasury, while apparently providing against the importation of disease, really opens a wide door for its admission, and offers it a hearty welcome.

But another phase of this order demands careful consideration. The government has been informed that sheep, horses and swine may be *media* for its communication, and these instructions for examining and quarantining such animals, when their owners will permit, show that the Secretary believes that all these animals suffer from *rinderpest.* It should here be noted that neither horses nor swine are subject to this affection. Two peccaries, it is true, suffered in the Jardin

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des Plantes in 1866, but peccaries are not swine; and swine have mixed for centuries with the diseased herds in Europe without once contracting *rinderpest*. *Swine*, therefore, should be subjected to no restriction nor quarantine, so far as this disease is concerned. Wash their filthy hides, and burn up all their fodder and litter, and the animals themselves may be admitted at once. With regard to horses, the case is precisely the same. But the most serious part of the order, and one which does not reflect on its author, is the impotence of the government to place any legal check on the importation of sheep and other ruminants from infected countries. These contract *rinderpest*, and should be subjected to precisely the same restrictions as cattle. Here, then, we have a second example, like that of England already referred to, of the injury which may be done by imposing undue restrictions upon the executive acting for a representative government. Here, as in England, that which is our special pride, and justly so, is made to contribute to our greatest danger.

Certain powers should be vested absolutely in the executive. If a foreign enemy were to land on our shores, it would be a poor policy to call a special meeting of Congress and have them discuss the matter before taking measures to expel the invader. In these exotic plagues prevailing in a country with which we have an importing trade in live stock, we must recognize a constant threat of invasion, and against this we must provide by wise and comprehensive statutes, if we would protect our shores from devastation. But legislation against an unknown enemy is likely to be faulty in the extreme, and, as a matter of fact, the order we are at present considering, is about as rational as if the executive were only empowered to operate by land against an enemy whose attack was made by sea, and whose method was by the destruction of our merchant marine. It is not creditable to us as an enlightened nation to have our executive fettered and helpless in the presence of such a peril, and every stockman in the country, and every man who has the national weal at heart, should raise his voice in earnest protest until this danger is removed. This is all the more imperative that another invasion of Western Europe by the *rinderpest* is now imminent. The Turkish war has led to its introduction into the area of hostilities, whence it has already spread into Hungary, and seriously threatens the nations on the Atlantic and the British Isles. It remains with the people of America to say whether it will once more find them unprepared, and their government in a bondage which will debar them from taking efficient measures to exclude it. A pressure should at once be brought upon Congress

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which would compel it to pass an act empowering and requiring the executive to prohibit the importation, not only of cattle and sheep, but of all ruminants and their fresh products, and of wool from infected countries. Also empowering and requiring him to see to the burning or disinfection of all litter, fodder, clothing and utensils used for such animals.

I will not at present dwell on the other European animal plagues, which we have not yet imported and acclimatized. I will simply say, that we find a parallel to our dangers from *rinderpest* in our risks from *sheep-pox*, *aphthous fever*, *malignant disease of solipeds* and others.

LUNG FEVER IN AMERICA.

Far greater danger attaches to the *lung fever*, which we have already imported, and are constantly liable to import anew. The great losses of England from this plague are mainly due to the continuous importations made from the Continent, and especially from Holland, where the disease is allowed to prevail most extensively. I have no means of learning how widespread is this affection in America, but that it prevails in all our seaboard States, between Connecticut and North Carolina, is well attested. There appears, however, to be good reason for supposing that it prevails more extensively now than it has done for a number of years past, and that herds are now infected that increase the general danger a thousand-fold. I find published accounts of the existence of the disease in herds, from Virginia in the South, to New York in the North. Some time ago it was alleged that a great part of the meat killed in Newark, N. J., was from animals suffering from *lung fever*. Dr. Michener, of Carversville, Pa., reports an outbreak in Clinton township, N. J., in July and August, 1877. It started with a cow purchased from a car-load sent from Ohio by New York city, and affected a number of adjacent herds, five of which are particularly specified. The deaths up to date were twenty-one, and recoveries eleven, while a number of cattle were sold to save their beef. The township's committee, acting under the New Jersey act of 1861, have prohibited the driving of cattle through the township without a permit, under a penalty of $100 per head of stock; they further prohibit the sale within the township, or outside for importation into it, of suspected cattle, under a similar penalty, and finally they prohibit the storage of hides, or other products of diseased cattle within 500 feet of the premises of any neighbor, under a penalty of $500. Whether the infected cow, which brought the disease to Clinton, contracted the germs in Ohio or

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New York, is a question of the deepest interest. If the former, this registers the infection of an additional State, and brings us one step nearer to that general infection of our western herds, which I have been prophesying for ten years.

Danger of Infection to High-Class Stock.

In connection with this subject, the following considerations are of prime importance. Within the last year I have been consulted by the owners of several first-class herds in New York and New Jersey, in which this disease has broken out. This infection of thoroughbred stock I look upon as the most dangerous fact in connection with the malady. So long as the affection was confined to the poor native dairy cows of our large cities, or the nondescript herds of the surrounding country, there was small danger of its rapid extension. Such animals are not sold to go a distance inland, but if sold at all, are retained in the district, or pass into consumption in the large cities on our seaboard. But from our Jersey, Ayrshire, Holstein, and Shorthorn herds, animals are being continually drafted to be shipped to Illinois, Texas, Kansas, Colorado, Minnesota, Dakota, Arizona, Nevada, etc. In a disease like this, in which the victims carry the germs for one, or even two months, before showing any outward symptoms, there is every opportunity for the communication of the malady to the western stock ranges, whenever a seller wishes to realize from a suspected, and, therefore, hazardous property, or even without such sharp practice, when the germs of the disease have entered a portion of the herd as yet supposed to be sound.

Let the disease once be introduced into the unfenced wilds of our great stock ranges in Texas, Colorado, Dakota, Utah, Arizona and Nevada, and we may bid a long, if not a permanent farewell, to our present sense of security. In these boundless stock ranges we find the near counterparts of the endless and uninclosed steppes of Eastern Europe and Central Asia, which from time immemorial have been the home and source of the rinderpest, the *lung fever*, the *sheep-pox*, and other plagues that have extended at frequent intervals to devastate Western Europe, India and China, and, to a less extent, the two Americas, Africa and Australia. Of the difficulty of extinguishing an animal plague on these wide and uninclosed ranges, Australia furnishes a notable example. This was infected with *lung fever* by means of an imported English cow in 1858. The disease spread, owing to the cupidity of a teamster, who pastured his oxen at night in the infected field, and worked them daily in public. Soon it

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reached the herds of the squatters, and spread with appalling rapidity from herd to herd, so as to create a panic, and determine legislative interference. This was at first carried out with great energy, whole herds of thousands of cattle were slaughtered, but the land was infected, and, after enormous losses, it appeared probable that the suppression of the disease could only be accomplished by the extinction of the bovine race in the Colony. The suppressive measures were accordingly arrested, and the stockmen fell back on the palliative of inoculation, based on the passing of the poison through the system of every calf, so that it would resist the disease in all subsequent exposures. The same experience has been had with the *rinderpest* in Tartar steppes.

With open, uninclosed plains, and half-wild herds of cattle, the veterinary commissions of the Russian government have found that every new effort for its extinction has ended like the last — in a miserable failure. This, too, will be our experience if we continue to neglect these terrible lessons of history. As yet, the *lung fever* in the United States appears to be confined to the older States and to inclosed farms. Here it is possible to grapple with it to advantage. Here we can still circumscribe every area of infection, and with a perfect certainty extirpate the seeds of the pestilence. But let it spread to our Western stock ranges and we may as well resign ourselves to the system of inoculation, which seeks to limit the losses by a permanent preservation of the poison, for assuredly its extinction will then prove a difficult, if not an impossible task. A recent writer claims that the disease is milder in our dry atmosphere than in that of Europe, but I would not have any one confide in any such supposed modification as a guaranty of security. It died, or was killed out, in moist England, during the last (eighteenth) century, and might be as easily suppressed here; but it has already prevailed for thirty-four years in the United States, in spite of the broad waters of the Atlantic, and the limited importations of new morbid seeds, and to-day it is more widely extended, and it appears to be quite as virulent as it has ever been in the past. Isolated cases, indeed, like that of the Clinton outbreak, of which the history can be obtained, show no material difference from an outbreak in Great Britain.

I reiterate, therefore, that if our great western sources of stock supply were infected, we would repeat at once the experience of Europe during a great war. The constant current of cattle traffic eastward would carry the poison all over the States, and maintain a permanent and fearful drain on our agricultural resources. To prevent its diffusion

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in such a case will be well-nigh impossible, for what with the infection of cattle cars, yards and loading banks, and the need of a quarantine of six weeks or two months on the frontier of every State to insure it against infection, the cattle trade would become virtually impracticable. If, on the other hand, the trade should go on, we could expect no smaller ratio of losses than have come on England in the last thirty years. In that period, Great Britain, with her 6,000,000 head of cattle, has lost in deaths close upon $500,000,000; we, therefore, with our 28,000,000 head should lose $2,000,000,000 in the same length of time, or fifty dollars for every man, woman and child in the United States. Here is a tax that may well bear consideration, and this is based only on our present number of cattle. They are increasing at the rate of 13,500,000 every ten years, and in proportion to their increase will be the amount of our prospective losses at any given time in the future. Thus, by the end of the century, our stock should be double, and losses increased at the same ratio would sum up $4,000,000,000 in thirty years. But, again, this represents the deaths alone, which sum up but a small portion of the real losses. If we count the deterioration of the survivors, the loss of prospective increase, the deterioration of the soil, the lessening of the harvests, the frequently recurring of expenses of cleansing and disinfection of stables, sheds, yards, trucks and utensils, the destruction of infected fodder, the cost of quarantining every new lot purchased, etc., we reach a sum total that may well rouse the most supine to activity.

Texas Fever in the North.

For the past few years *Texas fever* has been gradually extending its area of prevalence. The restrictive laws put in force, in 1868, have been gradually relaxed, and have finally fallen into disuse and been virtually abrogated, and Southern cattle have been shipped in large numbers to the extreme North, and even into Canada. In 1876, reports reached us of outbreaks in Cincinnati, Detroit, central New York and Massachusetts. In 1877, the disease has widely extended its ravages. It is impossible to fully estimate the area invaded, for some of the outbreaks that have come to the knowledge of the public have only leaked out by accident, where the parties concerned were extremely anxious to keep the matter quiet. Yet we have sufficient evidence of extensive losses in central Illinois, at Cleveland and other places in Ohio; at Erie, Pa.; Big Flats, Chemung county; Brighton, Monroe county; North Bangor, Franklin county; Watertown and Schenectady, N. Y.; in Washington county, Vt., and in Canada.

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The Cleveland and Erie outbreaks appear to have been due to the temporary want of freight trains during the few days of the strike in July, and the extensive range of the contagion around the cities clearly shows the number of southern cattle that were shipped in that period, and the extent to which this traffic has reached. Our experience in 1868 should render it unnecessary to dwell on the dangers of the traffic in southern cattle during the summer months. Then the mortality in the Northern States exceeded 15,000 head, representing a value of $500,000. This naturally brought a check on the traffic, and wholesome restrictions in the Middle States, by which we have all been benefited. But we here all alike lapsed into carelessness, and are now advancing by rapid strides toward the extensive losses of 1868.

Here is a fair field for government control, and I can see this subject in no other light than that which demands a control by the central government, equivalent to that which would apply to foreign plagues threatening our frontiers. The control need only exist along a given line, and can be maintained at small expense to the whole country, as compared with a permanent sanitary supervision at the frontier of every State, or at the boundary of every county. But it is unreasonable in the extreme, to expect the Middle States to be at all the expense of this supervision, which is really as much for the protection of the northern herds as of their own. If we leave them to meet the bills, can we blame them for allowing the southern stock to be shipped through their territory without unloading, and thereby drawing an income from the traffic, while allowing their northern neighbors to look after their own interests?

State rights should no more be allowed to stand in the way of such an arrangement than they should against the protection of our whole frontier from enemy or pestilence. States and counties would still be required to hold themselves ready to act in case of invasion, so as to crush every outbreak in the bud, for a limited amount of smuggling may still be expected, but there should be no need of their maintaining a constant supervision at considerable expense, when a mere pittance going to the general fund would give a satisfactory guaranty of protection.

I have recently started the question as to whether the line of control may not be varied from year to year, according to the extension southward of frosts that destroy the vegetation. I do not suppose that this can be decided without experiment, but it appears worthy of investigation, as calculated to place preventive measures on a rational basis, and to mete out equal justice to all. Another provision, which

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might easily be adopted, is the permission to send fat southern stock, indelibly marked, on through trains, to be unloaded only at their destination, into yards reserved for the purpose, where they shall be kept under bond, and slaughtered within a given number of days. With a disease like this, transmitted only by solid and liquid animal products, and not at all through the air, this is perfectly feasible and safe, and may be justly claimed as a right by the southern stock-owner.

It is only requisite that such stock should be carried through without unloading, and kept in secluded yards, under safe control, until slaughtered; that the cars which convey them shall be carefully cleansed and disinfected, and that the manure, etc., from cars, yards and slaughter-houses, shall be disposed of in such a way as will prevent it from coming in contact with other cattle, or with their food or drink.

GLANDERS AND FARCY.

In the absence of statistics, it is impossible to speak with certainty, but from my personal experience I would infer that *glanders* and *farcy* have been more than usually prevalent the past year. In various instances, whole stables of horses have been killed out; in others, they have dropped off by one or two at a time, out of a large stud, at intervals of several months; while in still others, a single chronic case has passed rapidly through half a dozen hands, each seeking to overreach his successor, and utterly reckless of the consequence to live stock or their owner. As the State of New York is without any law for the prevention of contagious diseases in animals, and as I consider this state of things is simply offering a premium to the unscrupulous, I feel called upon to note shortly three actual cases, as showing the practical working of this negation of law.

1st. A horse with chronic glanders, after passing through half a dozen hands, was sold to an unsuspecting victim, who owned a threshing machine. He used the new purchase on the machine, until three of his own horses were infected, and innocently stabled all of his horses in the stables of the various farmers where he worked, fed them from the mangers, and watered them from the troughs and buckets used for the farm horses. What the results were on these various farms I know not, though I saw one instance of the disease in the only stud I examined. To return to the purchaser of the glandered horse. He brought suit to recover the value of the purchase, and of his own horses infected by it, and after an expensive litigation, he had the mortification of suffering defeat, because the jury could not see that the seller had defrauded him.

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2d. The second case is that of a gray mare, five years old, which had been running from the nose for two months. It was sold with the assurance that it was only suffering from distemper, and an instalment of $100 paid. Two days after, I saw it; and finding all the early symptoms of glanders, advised the owner to return it to the vendor, and demand restitution. The mare was returned accordingly, and as the seller refused to reimburse the purchaser, a compromise was made for fifty dollars to avoid a troublesome and uncertain law suit. Here again the vendor of the diseased animal received his unjust reward, and is now ready to sell his glandered mare to a second party on the same terms, with the blessed consciousness that if he can only keep her moving fast enough she will prove a most lucrative possession.

3d. These were but money losses, though pretty accurately illustrating the general course of things in our State.

My third instance is much more serious, and the danger is not to be estimated by dollars and cents. A gentleman who is a tenant farmer, a man of education and an author, received with his farm a team, one of which suffered from chronic glanders. As the discharge from the nose obstinately persisted, he began to be apprehensive, but was reassured by the owner of the farm and horse insisting that there was nothing serious. The tenant has now, however, contracted glanders, and suffers much from physical prostration, shooting pains in different parts, burning of the lips and nose, and a tenacious discharge from the latter. Though he has taken the greatest possible precautions, one of his family also begins to present suspicious symptoms. Such are the fruits of the existing apathy on this subject, and of the preservation of glandered horses. A nefarious trade always accruing to the benefit of the evil doer, a wide contamination of the stock of innocent and unsuspecting parties, and the infliction on the human being of one of the most painful, loathsome and fatal of diseases. Every consideration of mutual rights; every claim of justice and humanity; every precept of religion and morality, demand that this state of things be speedily righted.

OTHER CONTAGIOUS DISEASES.

I would gladly pass on to notice the other animal diseases that demand legislative control, but I fear I have already trespassed too far on your patience. I will not say that the so-called *hog cholera*, which in 1876 inflicted losses to the amount of $20,000,000, according to the estimate of the government statistician, has been scarcely

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less prevalent in 1877. *Malignant anthrax* has been unusually prevalent in the past year, and many instances have come under my notice of its appearance in new localities, and on land that has always heretofore been salubrious. This is one of the most indestructible of all morbid poisons; it can resist alike a high temperature and the most extreme cold of winter; is frequently preserved for years in soils and fodders without abating its activity, and has been repeatedly carried half way round the world, in hides, hairs and other animal products, without losing its virulence. It is, moreover, as contagious to man as it is to beast, and yearly claims a number of human victims. I will only name such diseases as *hydrophobia* and *tuberculosis*, both readily communicable from animals to man, and both largely prevalent. *Contagious foot-rot* of sheep, and *epizootic abortion* in cows, both of which entail extensive losses, and should be preventible; *trichinosis* and *echinococcus*, diseases both of which are communicable to man in their most deadly form.

Still other parasites develop the most fatal epizootics in domestic animals, and could be successfully and beneficially made the objects of legislative control. Two years ago I predicted that unless some check were put upon the propagation of the *lung worms* of sheep, these would soon prove as disastrous in America as they now are in England. Within a week I had information from different counties in Illinois and Iowa of the extraordinary prevalence of these parasites, and of the ruinous mortality in lambs. One Iowa flock-master assured me, that owing to these losses, the sheep in his county had been diminished by 100,000 head in seven years, though the true cause of the deaths had remained a mystery until he chanced to light on my remarks on the lung worms. I still continue to receive frequent inquiries as to what can be done for these lung worms, as well as for the *round worms* and *tape-worms* of the intestines of sheep. A letter just to hand from Illinois, tells of the writer having lost eighty-five lambs within a week or two, while the remainder of his flock is improving under the treatment prescribed. Another flock-master in our own State has had to vacate a portion of his farm because of its impregnation with the germs of a tape-worm of sheep. The important question in such cases is not simply that of the loss to the individual, but also of the spread of the eggs of these parasites through running water, through fodder, through grain, and even through the bodies of the older and less seriously affected sheep, sold and sent to a distance, where they infect new and hitherto healthy sheep runs, and render further sheep raising unprofitable.

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Regarding the *liver rot*, I have not yet, in America, seen any specimens of the *flukes* that determine it. But Mr. Stewart assures me of its prevalence on Long Island, so that there can be no climatic incompatibility, and without due care we may ere long find our flocks decimated by this, as they are in England, and as they have been recently in the colony of Victoria. From these liver parasites England has repeatedly lost as many as 3,000,000 head in one year, and with our larger flocks we might expect relatively larger losses if these parasites are diffused over the continent.

But I must close. I have mainly dwelt on the more serious of the contagions of animals; those the neglect of which is the most reprehensible and must prove the most disastrous. These can easily be supplemented by other unnamed diseases, which it might be desirable to include under legislative control. But the considerations attachable to those already named, ought to be sufficient to rouse our State Legislature and Congress to immediate action.

Above all, should the agricultural community, by whom the evil must first be felt, exert their utmost efforts to rectify the existing state of things. Let boards of agriculture, local farmers' clubs, farmers' alliances, and granges unite in one common demand for the protection of their live stock, and it will most certainly be considered and conceded. There is no need for embracing all the communicable diseases of animals, or even all of those that I have enumerated. Let us concentrate our efforts on two or three of the most dangerous, on the exclusion of all the foreign animal plagues, and the extirpation of those that are particularly ruinous, in each State, and the good work thus commenced will approve itself to the community, and we may advance from step to step in purging the country of its pestilences, and in securing health to man and beast, a permanent prosperity to agriculture, and a solid and enduring basis of wealth to the nation.

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ECONOMIC ENTOMOLOGY DURING THE YEAR 1877.

To the Executive Committee of the New York State Agricultural Society:

I beg leave to present the following report for the year 1877:

The great importance of the study of our insect foes, who are annually inflicting such serious depredations upon the agricultural products of our country, and in a less degree upon many other sources of our wealth and comfort, has been signally recognized by the action of the Congress of the United States in their appointment during the preceding year of an Entomological Commission, specially charged with the duty of studying and reporting upon some of our more injurious insects. The commission was appointed in compliance with the earnest request made from several of our Western States and Territories, that the general government should aid them in their efforts to defend themselves from the scourge to which they were subjected in the annual visitations of the Rocky Mountain Locust —the *Caloptenus spretus* — the fearful ravages of which have been told to us through the public press, and in the direct appeals made to us for material aid to provide destitute families with the means of subsistence.

The commission consists of three gentlemen, whose studies in practical entomology eminently fit them for the work, viz., Prof. Riley, for the past ten years State Entomologist of Missouri; Dr. A. S. Packard, editor of the American Naturalist, and Prof. Thomas, State Entomologist of Illinois.

The commission has earnestly entered upon and successfully prosecuted its work during the preceding year. To insure its greater efficiency, a division of the field of its operations and of labor has been made. To Prof. Riley is assigned the country east of the Rocky Mountains and south of the fortieth parallel, including Texas, Arkansas, Missouri, Kansas, Colorado, New Mexico, and, together with Dr. Packard, British America west of the ninety-fourth meridian. He will devote himself to the natural history of the insects, the means of destruction, and their insect enemies and parasites.

Dr. Packard has for his field, Wyoming, Montana, Utah, Idaho and the Pacific Coast. He will specially study the anatomy and embryology of the insects, and their migrations.

Prof. Thomas has the remaining portion of the country east of

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the Rocky Mountains not above mentioned, and will devote himself to geographical distribution, enemies other than insect, and to the agricultural bearings of the subject.

While the commission is specially charged with the investigation of the Rocky Mountain locust, they will not neglect other injurious insects which come within their observation. Two bulletins have been issued by them during the year, of which, number one gives directions for the best method of destruction of the young locusts, and number two the natural history of the locust, accompanied by illustrations of the several transformations and of the manner of depositing the eggs, and by a map of the infested territory. The bulletins are in advance of the annual reports to be issued.

The work of this commission, and the practical results which shall follow its labor, will be anxiously awaited by many others than those who are more immediately interested in its present field of operations west of the Mississippi. If it shall be found that, in return for the liberal appropriation made for its support, it will be able to make such recommendations, and initiate such measures as shall hereafter relieve the Western States and territories, even to any great extent, from the annual visitations which have brought starvation to many homes, and poverty to a great extent of country, then a great and important point has been made. If it be found practicable successfully to contend with hosts of insects that darken the sun in their flight, borne on powerful wings from some distant region, and suddenly dropping from the skies, to lay waste broad fields, which till then gave every prospect of abundant harvest — how much more simple will it be to protect ourselves from other insect pests, endowed with more limited powers of locomotion, and less destructive capabilities, whose life-history we already know, or whose economy we can easily study. With the present commission a success, its continuance hereafter will be demanded, that similar investigations may be directed to other of our insect foes, which year by year inflict so burdensome a tax upon the resources of our country; as, for example, the Hessian fly (*Cecidomyia destructor*), the wheat-midge (*Diplosis tritici*), the joint-worm (*Isosoma hordei*), the army worm (*Leucania unipuncta*), the cotton-worm (*Aletia argillacea*), the codling-moth (*Carpocapsa pomonella*), the chinch-bug (*Lygæus leucopterus*),* and at least a score of others scarcely less destructive. Dr. Packard has estimated that there are probably within the limits of the United States five thousand species of insects at present, or, with the spread of civilization, soon

* Now *Blissus leucopterus*.

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to be, preying upon our field and garden crops, our shade, ornamental and forest trees. Dr. Packard also estimates that the annual agricultural products of the United States, reported in the last census at two and a-half billions of dollars ($2,500,000,000), are diminished annually to the amount of over two hundred millions of dollars ($200,000,000), from the depredations of injurious insects. Thus, the losses from the ravages of the locusts in the border States in 1874 were computed at forty-five millions of dollars ($45,000,000); the estimated loss accruing from the chinch-bug in Illinois in 1864 was calculated to exceed seventy-three millions of dollars ($73,000,000); the average annual loss from the attacks of the cotton-worm is probably between twenty-five and fifty millons of dollars. In view of such enormous taxes, as they are rightfully to be regarded, upon our nation's industry and prosperity, is it too much to demand from each one of the States, and of the general government, that liberal appropriations to the extreme limit of their proper employment, shall annually be made for the purpose of conducting such investigations as there is reason to believe will result in the saving of at least one-fourth of this annual loss.

Beyond the work of the commission above referred to, I recall no very extensive additions to the literature of economic entomology during the past year. The valuable State reports heretofore received from Missouri and Illinois have been temporarily suspended by the transfer of the State Entomologists to a broader field of labor, as above stated. Several papers of interest have been given in our scientific journals, conveying matters of economic value, as the paper read by Prof. Grote at the meeting of the "American Association for the Advancement of Science," at Nashville, describing a moth which had been found to be quite injurious to the white and red pines (*Pinus strobus* and *P. resinosus*) in the vicinity of Buffalo. The same species had been brought to my notice in the year 1874, as destructive to a group of young red pines in the neighborhood of Albany, and from examination of the larva embedded in the pitch which their attack had caused to exude from the trees, I had been able to obtain the moth. It will be known as *Nephopteryx Zimmermani* Grote. *

Several years ago I had noticed the destruction, through insect agency, of many of the poplars (*Populus tremuloides*) at Centre, Albany county, and at points intermediate to Albany and Schenectady, on the line of the New York Central Railroad. The trunks were thickly scarred by the numerous holes, subsequently roughly over-

* The species has since been transferred to the genus *Pinipestis* Grote.

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grown, which had been made by the internal borer for the escape of the perfected insect. Commencing usually not far from the surface of the ground, the borings of the larva — its channels averaging one-fourth of an inch in diameter — annually extended further up the trunk and into the limbs, until the tree, with its vitality each year more and more impaired, finally died. In every instance when the attack had been of long standing, the tree had either died, or was fast approaching its end. In the year 1872 I was able to refer these injuries to some species of Cossus, from finding several of the pupa cases half-way extruding from the trunks, as is the habit of the members of this genus in their final transformation. An examination of the pupa cases showed it to be entirely distinct from the two species of Cossus hitherto known to us, viz., the common *C. robiniæ*, so destructive to locusts and oaks, and the rare *C. quercipeida*, discovered by me some years ago, as it had just emerged from the trunk of a black oak, of which the typical pair in my collection are the only known examples up to the present time.

During the past year I was so fortunate as to find the moth, which might still have remained for years undetected, had not the most critical search been made for it, at the period of its apparition, as fresh pupa cases, from which moths had probably emerged the preceding night, were projecting from the trees. So exactly did the insect simulate in color and marking the bark on which it sat, that, although about an inch in length, the sharp eye of an experienced collector carefully examined the place pointed out to him where one was resting, without detecting its presence. In compliment to the locality which has made this interesting addition to our State fauna, and valuable contribution to economic entomology, I have described this newly discovered poplar borer as *Cossus Centerensis*.

In conclusion, I would state that the Entomological Collection of the Society is in good condition; a few additions have been made to it during the year, to be followed by many others, so soon as my collections made during the last year shall have been worked up. These have been unprecedently large, and will, from their extent and unusual value, enable me to place many desirable examples in the Society's collection.

A catalogue of the collection has been in part made, but in consideration of its being a numbered catalogue, and the desirability of the additions being placed in their numerical order, work upon it was suspended until the additional examples could be arranged.

Respectfully submitted.

ALBANY, *January* 16, 1878. J. A. LINTNER.

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EXPERIMENTATION AND CHEMICAL ANALYSIS AS HANDMAIDS OF AGRICULTURE.

Address delivered before the Society at the Annual Meeting, January 22, 1879,
By GEORGE C. CALDWELL, B. S., Ph. D.,
Professor of Agricultural and Analytical Chemistry in Cornell University.

Of all the sciences taught in our schools and colleges, none is so exclusively based on the results of experimental inquiry, and none is so entirely dependent on continued experimentation as the science of chemistry; and of all the useful arts none so much owes its present condition and all its hopes for the future, to what experimental inquiry has done and may do for it, as does the art of agriculture. An experiment is defined by Webster to be an act or operation designed to discover some unknown truth, principle or effect, or to establish it when discovered. It consists in bringing together, and within the sphere of mutual action, objects or forces which, without a special act or operation performed with this end in view, would not come together. But that is not all. If a man brings thus together what, without his agency, would have forever remained apart, and then shuts his eyes to what takes place, he might as well have spared himself the trouble. His powers of observation must also be brought into play.

My statement that agriculture is eminently an experimental art, as chemistry is eminently an experimental science, will certainly not be difficult of demonstration before an audience of farmers, whether we consider only the more practical part of our agricultural knowledge which is shared alike by the common laborer on the farm and the most intelligent agriculturist, or that more scientific part which is acquired only by study and thought—say, if you will, that a large share of the knowledge upon which our common agricultural practice is based, is itself founded on experience. What, then, is experience, especially in agriculture, but knowledge founded on the results of a multitude of experiments. The same authority before quoted defines "experience" as "trial, or a series of trials and experiments;" and he draws his illustration of the meaning of the word from agriculture: "A man attempts to raise wheat on moist or clayey ground, and his attempt fails of suc-

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cess, *experience* proves that wheat will not flourish on such soil; he repeats the trial, and his experience proves the same fact. A single trial is usually denominated an experiment. Experience may be a series of trials, or the result of such trials." Some of these experiments whose results constitute our present agricultural knowledge, were, perhaps, performed hundreds of years ago, and without recognition at the time as experiments; but they were such, nevertheless; and if they had not been once, or even many times performed with decisive results, they would have to be performed again. And if it were possible for such catastrophe to occur as should blot out all this agricultural knowledge, we should have no resort left us but to go to work and build up this useful art again by experiment. We could not reconstruct it by reasoning it out, unless we had facts based on the results of experiments on which to found our reasoning.

The recognition of this principle amongst intelligent farmers is shown by the eager interest that they manifest in any experiments that they themselves, or their neighbors, may be trying. Let some one, more progressive, perhaps, than those about him, attempt the cultivation of some new crop never before heard of in the neighborhood, or some new and striking mode of culture of an old crop, or some new fertilizer, and he will not lack for interested observers; while he alone takes the trouble to perform the experiment, there will be many to make the observations and to treasure up this new addition to their experience.

No better illustration of the absolute necessity of experimentation for agricultural progress is to be found than that which is furnished by the once famous contest between Liebig and Lawes and Gilbert, in respect to the mineral theory of the former. It is well established that vegetation can get all the carbon it requires, even for the most luxuriant crop, from the carbonic acid of the atmosphere, and that nothing of any consequence is gained, if indeed there is any gain at all, in supplying compounds of carbon through the roots; there appeared to Liebig to be sufficiently good reasons for taking a similar position in regard to nitrogen; he called to mind the fact that from an irrigated meadow we may get good crops of grass, and carry off, year after year, large quantities of nitrogen as well as carbon, while the irrigation supplies nothing but mineral matters; thus the produce of nitrogen in the crops of an irrigated but otherwise unmanured meadow may be larger than from an upland, manured wheat field. Further, he observed that the nitrogen in a clover or a pea crop, supplied with no nitrogenous manure, is much greater than in a potato

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crop that was manured; hence, he says, since we get just as much nitrogen in the unmanured crop of the meadow as in the manured crop of the upland, it follows that the manure supplies to the upland crop nothing but mineral matters — just what was supplied in the overflowing waters of the meadow. Hence his mineral theory, that "we cannot increase the fertility of our fields by a supply of nitrogenous manures or by salts of ammonia;" and, to quote again his own words, that "ashes represent the whole nourishment that vegetation receives from the soil." In further support of his views, he referred to the fields of the delta of the Nile, whose fertility dates as far back as history or tradition can tell us anything about it, and is unimpaired now; these fields are supplied with no other manure than the ashes of the excrements of the camels — the excrements being dried and used for fuel — and what is supplied in the annual inundations; in neither does he recognize the supply of any notable quantities of nitrogen. He further states that, in some localities in Hungary, tobacco and wheat have been raised on the same land for centuries without any supply of nitrogenous manure; and, finally, he refers to the forests for which the atmospheric supply of nitrogen is amply sufficient for the demands of years and centuries of years. If this theory be true, then it will answer just as well to burn up the farm-yard manure and scatter the ashes over the field as to team out and spread the heavy manure itself; and the more it fire-fangs in the pile the better, for there will be less of it to carry out, and the heating can cause no loss of mineral matters, ammonia compounds not being regarded as mineral matters by Liebig in this connection.

This course of reasoning seemed to him, and to some others, to be so satisfactory that, even before it had been tested by experiment, a few English farmers were ready to invest in Liebig's patent wheat manure, which was so made up as to resemble in composition the ashes of wheat straw and grain, in suitable proportions. But the theory was not in accordance with the experience of Lawes and Gilbert; that is, it was not in accord with the results of experiments that they had been carrying on for some years; they instituted a new series of experiments for the express purpose of testing the theory; and as soon as this test was fairly applied to it, which was the only thing that could be done to prove or disprove its soundness, it fell utterly; the too confident farmers would have profited better if they had waited a little; but they all added the contribution of their experience to the weight of the testimony of Lawes and Gilbert.

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Another no less interesting and important question was that of the possibility of the assimilation by our crops of any of that immense and inexhaustible store of nitrogen that exists in the atmosphere in the free state; if such assimilation were possible, then certainly some way could be found for producing the crops with its aid. There was absolutely no way to answer this question except by experiment, by forcing plants to grow as they never do in nature where they could get no nitrogen except this free nitrogen of the atmosphere. Three laborious series of experiments were performed; two of these, one by that worthy patriarch of agricultural chemists, Boussingault, and the other by Lawes, Gilbert and Pugh, gave most decided negative answers to the question, while a third by Ville, gave a decided affirmative answer. Some who are not thoroughly informed in respect to all the circumstances connected with these investigations, especially those carried on by Ville, persist in regarding the question as still unsettled; but all others, including all the most eminent agricultural chemists and vegetable physiologists have accepted the negative answer, and will abide by it until more trustworthy experimental evidence is furnished in support of Ville's very peculiar results.

In the year 1851 an institution was founded in the town of Moeckern, in Saxony, which was to be devoted to the promotion of agriculture, both in respect to its practice and its science, and a young chemist was put at its head who was to give himself up entirely to this work. The institution answered its purpose so well that other institutions of like character sprang up in other parts of Germany. Then they appeared in Austria, France, Italy, Switzerland, Russia, England, Sweden, Holland, and finally to a very feeble extent in this country. Now what did they call these institutions that were working so acceptably for the advancement of agriculture as to increase in number from one to not far from a hundred in twenty-seven years. They named them *experiment stations*. What clearer recognition could be asked for than this of the principle that experimental inquiry is at the very foundation of progress in agriculture.

We are living in an age of wonderful progress in respect to the useful arts; many of us can remember when there were but a few and short lines of railroad in the country, and no telegraphs, and when all the work on the farm was performed with hand implements, and when stable manure, lime and plaster were the only manures that we thought of putting on our soils. Agriculture has shared in this progress with her sister arts; new ideas are continually presented to us for our acceptance and practical application, and every progressive

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farmer, as well as every progressive artisan, keeps a careful watch for these new suggestions to see if there are any that he may use to increase the efficiency of his own investments in capital and labor. All these new ideas, especially in agriculture are the result directly or indirectly of experimental inquiry; and so widely variable are the circumstances of soil, climate, and weather in different localities, that no farmer can always be certain that a new kind of crop, or mode of culture, or a new fertilizer, will yield him profitable results, unless he also has tested the matter by experiment, or unless it has been tested under conditions closely resembling those that prevail in his own case; therefore experimental inquiry is most truly a handmaid of agriculture, constantly serving to originate new ideas, and as constantly needed to test her ideas in new places. Her work may be done both in the experiment station and on every man's farm; in the one case, where she has at her service scientific men trained in habits of experimentation and observation, we may look more particularly for new suggestions; in the other, where her workers are men with sound, practical sense, vitally interested in the question of profit and loss, she finds the best means for testing the usefulness of these suggestions. But neither department of inquiry is confined exclusively to one field; many a valuable thought may come from a farmer's experiments, and it may be one that can only be tested by scientific methods and appliances.

The experiment station appears to be then without question an essential feature of any system of progressive agriculture; and it is no matter of wonder or surprise that, in those countries where this art must make progress in order to keep pace with the demand that it is required to meet, the experiment station has fully established its usefulness and its right to existence and support. Most of you are doubtless somewhat acquainted with the workings of these institutions, but, nevertheless, it may be profitable to dwell for a little space on the consideration of their present condition. A small journal, *Die Landwirthschaftlichen Versuchs-Stationen*, published in Germany in six-yearly numbers, contains an account of a large share of the original investigations that are carried on at the stations. In 1877, the twenty-fifth anniversary of the establishment of the station at Moeckern was celebrated by a gathering at that place of the directors of most of the German stations, and others, and by the issue of a special volume of the journal above mentioned, devoted to the history of the whole system of experimental stations in Germany and elsewhere. The volume is full of interest, and by no means least so where an account

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is given of the difficulties that were successfully met and overcome in the establishment of the first station, and its struggles for existence and approval in its infancy. Dr. E. Wolff, whose name is now familiar to all students of agricultural chemistry, was put at the head of the new station, with the munificent salary of 300 thalers, equivalent to about $220.

The next station was established in 1853, the next in 1855, and in 1856 the next one appeared at Nancy, in France. From that time to the present, every year, with the single exception of the year 1860, witnessed the creation of at least one station, and generally of several. In 1872 twelve stations were founded, and in 1877 twenty. In 1877 there were at least 120 stations, of which sixty-five were in Germany; thirteen in Austria; ten in Italy; seven in Sweden; eighteen in France; three in Russia, and so on through the other countries of Europe — Belgium, Switzerland, Holland, Denmark, Great Britain, Spain and Hungary.

As to the pecuniary support of these stations, we find that it is derived mainly from the state, the amounts thus provided ranging from $400 to $4,000; out of a list of forty-seven stations, the sources of whose income is given, all but four receive state aid. Some of them have other sources of income — from farmers' clubs, private donations, receipts for chemical work, so that the average income is not far from three or four thousand dollars, and in some few cases it runs up to $10,000.

At nearly every station prominence is given to some one, two or three different kinds of work, which is partly scientific and partly more directly practical. Thus, in scientific investigation, we find that at sixteen stations a specialty is made of the examination of soils; at twenty-four stations, modes of culture and manuring; at thirteen, the grape and the manufacture of wine; at three, fruit culture; at one, olive culture (this station, of course, being in Italy); at nine, forest culture; at two, the culture of swamps and moorlands; at twenty-eight, vegetable physiology; at eleven, diseases of plants; at twenty, foddering experiments and animal physiology; at eleven, milk; at six, silk culture; at three, sugar industry, and at four, the manufacture of spirits and beer. In respect to work that is directly practical, such as the analysis of manures for farmers and dealers, and the like, we see that at fifty-four stations a specialty is made of the examination of commercial fertilizers, either under state laws that require the inspection and certification of these commodities by the station, or under private arrangements between the station, the dealers and the con-

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sumers. At forty-four stations the same work is done in respect to the trade in seeds, and at thirty-eight the same with respect to concentrated fodder-stuffs.

This brief review of the kind of work done at these stations cannot but give a striking idea of the useful and worthy manner in which they are performing the part assigned to them in the promotion of agricultural science and practice. If more evidence of this is wanted, we find in this volume of *Die Versuchs-Stationen*, to which I referred a short time ago, the titles of over 2,000 papers on original researches in all the different fields of agricultural science and practice that have been carried on at these stations, inclusive of the work that has been done at Rothamsted, England, where Mr. Lawes has supported a veritable and most useful experiment station at his own expense for more than thirty years. As to the record of more practical work, we find that at one of these stations in a single year, and the first year of its existence, seventy-four analyses were made of commercial fertilizers; forty-six other analyses of miscellaneous manures; seventeen of fodder-stuffs; twenty-four of marls; four complete soil analyses; six analyses of salt, and two of water.

At one station in France, 567 analyses of commercial fertilizers were executed last year. At another station, 948 different substances were analyzed, requiring about 4,200 single determinations. All this work of one station cannot, of course, be done by a single person, and we find at most of the stations one or more assistants. The immediate director of the stations is, in most cases, a chemist, and thus the fundamental part taken by agricultural chemistry in the work of agricultural investigation is recognized.

What is our record in this great country, whose agriculture is by long odds its most important industry, with respect to experiment stations? Nothing to be proud of; there are at the most but three stations, one of which is in a southern state, and the others are in New England. This great State of New York, most eminently an agricultural state, with vast interest invested in this industry; with a great artery of water communication running from one end of it to the other, opening up all its parts to the markets of the world; with a soil whose native fertility is pretty well used up, so that her farmers need every aid that science and skill can furnish them to bring the yield of its acres up to a fair average; this state, that should really be first and foremost in the establishment and liberal endowment of even more than one experimental station, to be devoted to the further development of her great agricultural resources and privileges, lags

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behind other and smaller states. May we not hope, for the credit of our commonwealth, that this will not much longer be the condition of affairs in respect to this matter?

But I must pass on to the consideration of the other part of my theme — chemical analysis as the handmaid of agriculture. The value and importance of the services that analytical chemistry can render to agriculture, will not, I think, be questioned by anyone who duly considers their relations to each other, and are fully indicated, as already stated, by the prominent position occupied by chemistry at all the experiment stations, and by the frequent and increasing demand that is made for chemical services by farmers, wherever those services are made sufficiently inexpensive, so that he feels that he can afford to use them. Of the use of chemical analysis in connection with agricultural experimentation I will not stop to speak, although hardly any agricultural investigation can be carried on without it; I will confine myself simply to the consideration of its direct practical application in the examination of some of the materials with which the farmer works.

The most important of these materials is beyond question the soil. In his expectations of what chemistry might do for him, probably the farmer has nowhere been so much disappointed as in respect to its application to the analysis of his soils, especially since the advent of commercial fertilizers in which any constituent of the food of plants can be supplied at pleasure. If he could but send his soil to the chemist, and by return of mail receive definite information as to the particular elements of plant food that were wanting, the difficult problem of proper manuring would be wonderfully simplified. But the problem cannot be so easily solved; the analysis requires the time and skill of a thoroughly trained chemist, both of which have their market value, and it is therefore expensive. Of the sample that is sent to him, any skillful chemist can give the correct composition; but when we come to apply the results of that analysis to the field from which the sample was taken, the result will be, in most cases, entirely worthless, for various reasons. In the first place, it is almost impossible to put into the two or three pounds of soil that is sent to the chemist what will be an accurate representation of the soil of the whole field of several acres, or even of one acre; the soil of an acre to the depth of one foot weighs about 4,000,000 pounds; you can appreciate for yourselves the exceeding care that must be taken in making up the sample of two or three pounds so that it shall be a perfect representation, in miniature, of all the possible variations in

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that immense mass of soil, even if the field possesses a fair uniformity throughout. But, allowing that you are satisfied with the sample, the chemist to whom you send it can, at the most, handle a pound of it in his analytical operations, and for some of the steps less than a half a pound; now, none of his processes of analysis are absolutely perfect, and the results of two operations will, as a general thing, not exactly coincide; certain limits of error are allowed for every operation, and the limits are wider the greater the effects of the methods which it is necessary to use, or the more difficult the operation. For example, in the determination of the proportion of potash, the chemist would in any case make two independent analyses; if the result of one analysis should indicate 0.45 and the other 0.48 per cent, the error of 0.03 per cent would by all chemists be regarded as coming within the allowable limits, and the analysis would be regarded as a good one. We will suppose that he obtained this result with one pound of soil; 0.45 of a pound of potash in 100 means 18,000 pounds in the soil of an acre one foot in depth; 0.48 of a pound indicates 19,200 pounds to the acre, a difference of 1,800 pounds, not far from a ton. A good potato or corn crop may take from the soil a hundred pounds of potash; therefore, we might produce corn or potatoes on the same soil for eighteen or twenty years, before even a skillful chemist could detect the difference with any degree of positiveness. Four hundred pounds of potash salts would be a liberal dressing of this fertilizer; but four such dressings would have to be added, or even five, before a chemist could say with certainty that the proportion of potash had been increased; and even then it might escape detection by the most accurate methods of examination that he could bring to bear upon it. In the case, then, of the average run of soils I cannot see that a chemical analysis will be of any use to the farmer, for the slight but unavoidable errors of the analysis, becomes so immensely multiplied when applied to the soil of the field. There may be exceptional cases of barrenness and fertility, that may be explained by the results of such an analysis, especially if repeated on two or three samples, each one of which is carefully selected; the entire absence of an element of plant food, or any unusually large proportion of a noxious substance would be revealed by such treatment, and the proper course to be pursued to remedy the sterility would be indicated; but such cases are rare.

The physical and mechanical condition of a soil is a matter of no less importance than its chemical composition — what may be considered as determining the general fitness of the soil as a home for

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the plant. As in considering the desirability of a house, it is of more consequence to know whether it is well ventilated and easily heated and generally healthy, and whether its store-rooms are calculated to keep supplies of food in good order, than whether the store-rooms are full or empty; so in inquiring with respect to the value of a soil, we want to know whether it is cold or warm; whether it is loose and porous to admit air freely; whether it is provided with proper drainage, and will yet hold sufficient water for the purposes of vegetation, and has good absorbent powers for plant food; unless a soil is what it should be with respect to these qualities, we may surcharge it with plant food and yet it will be a poor soil. Soils differ more widely as a general thing with reference to these qualities than in respect to the proportions of assimilable plant food that they contain; quantitative results obtained in the examination of the soil, with respect to these qualities, can be applied with more satisfaction to large masses of soil than in the case of the determination of the quantity of the plant food; hence this kind of an examination is much more likely to have a direct practical value than the other, especially as it is much more easily executed.

Every arable soil possesses, as you know, the power of abstracting ammonia, potash or phosphoric acid from any solutions of these substances that may be brought in contact with it, and fixing them in difficultly soluble forms within a few inches of the surface; hence we find only traces of either of these substances escaping in the drainage waters even of rich soils; and it appears from the results of a large number of determinations of this absorptive power, that it bears a close relation to the fertility of the soil — the best soils have in nearly all cases the largest absorptive power. By a process of sifting with two or three sieves of different degrees of fineness, and by a process of silt-analysis, which consists in separating out the finest part of the soil by agitation with water, the proportion of fine and coarse material in the soil can be determined. The best soils have usually the largest proportion of very fine material such as may be determined by the process of silt-analysis; and along with this high proportion of finest earth there is usually found a high absorptive power for plant food. Thus it appears that the most profitable examination of the soil that can usually be made in the laboratory leaves quite out of consideration the quantity of plant food in it, and confines itself rather to the condition in which the food in general exists there.

This opinion that I have expressed of the small practical value of

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the chemical analysis of soils finds confirmation in the fact that a very small number of such analyses are made for farmers at the experimental stations, although a larger number may be made in connection with agricultural investigations.

The farmer has no more need of the chemist's services for the examination of his stable manure than for the examination of his soils. He would be a poor farmer, indeed, who could not tell from his own experience, whether any particular sample of home-made manure was good, medium or poor in quality. We would give quite as much for a good, sensible farmer's opinion in the matter as for the chemist's. But it is altogether another thing when we come to consider the concentrated manures which are regular commodities of trade, the manufacture of which the farmer has had no opportunity to overlook, as he has in the case of his own home-made manure. Everyone who has handled these manures know well enough that there is nothing in their appearance or odor that can be depended upon as an indication of their richness in plant food. Because this is so consumers depend, for want of anything better, on the recommendations of others who have used these fertilizers. And to meet this demand, we find appended to every circular setting forth the good qualities of any particular brand of phosphate a formidable list of these recommendations. Granting that such testimonials are in most cases given in good faith, their value is comparatively small as a means of comparison between different brands; most of them are based on a single year's trial, and without any careful comparison with some familiar standard, as the yield of an unmanured plot, or one richly manured with stable manure; and without any repetition of the trial, or any such comparison of the effect produced by the fertilizer with some known standard, *no one can safely assert that the manure has produced any effect at all, or that its use has been profitable.* If we look over the records of the experiments of Lawes and Gilbert, where they have raised wheat on unmanured plots for many years in succession, as a standard by which to measure the effect of the various mixture of plant food, we find that the yield of this unmanured plot has varied from fourteen to twenty-three bushels per acre — an increase of more than one-third in some years over others. I venture to say that many a strong testimonial of a fertilizer has been furnished on the strength of a smaller proportionate increase over the crop of the previous year than this, the increase being attributed entirely to the fertilizer. A certain fertilizer is applied and a good crop is obtained, and the farmer is in general too ready to jump at the con-

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clusion that the result was due to the fertilizer, forgetting how many other things go to make up a good crop of any kind.

If it be said that a farmer might experiment on a small scale for himself with some particular brand that seems to be most highly recommended, and test the reliability of these recommendations for himself, we reply that this is a slow and tedious method of reaching the desired result. The farmer does not know, in the first place, whether he can make profitable use of this kind of a fertilizer, such as a superphosphate or guano, under any conditions, even if it be of the best quality; and in the second place, one year's trial is not ordinarily sufficient to establish a safe answer to the question whether he can make profitable use of the particular brand of fertilizer tested. Field experiments with concentrated manures, if carefully conducted, are attended with no little trouble and expense. Farmers have no time to spare on experiments performed with a view to ascertain which out of the bewildering multitude of fertilizers offered for sale in the market appears to be the richest in plant food, when there is a way to do it, by chemical analysis, with promptness and with a degree of accuracy far beyond what he can attain even under the most favorable conditions by his experiments.

How absurd it would be for a miner having several veins of ore of different degrees of richness at his command — some almost worthless and some very rich — to work one vein one year, and another the next, and another the next, and so on till he found the best, instead of taking samples of his ore to the chemist at once. It is quite as absurd for the farmer to attempt to decide by field experiment which is the best of several samples of a superphosphate. It seems that the little time and means that he has to spare for field experiments are sadly wasted if thus employed, and that the combined results of all his experiments performed with this end in view do not contribute one iota to real agricultural progress.

What is wanted is that manufacturers and dealers shall give up these long lists of testimonials, at the best of questionable value, and give instead a plain statement of the proportion of available and of insoluble phosphoric acid and nitrogen, and of potash, in the fertilizer, which they are willing to guarantee. Then the farmer knows what he buys, especially if manufacturers and dealers are made to feel that the correctness of their statements as to the composition of the articles that they sell is liable to be tested by the consumers, who may themselves, from time to time, take samples to a chemist for examination. As matters are now, I do not think that the average intelligent farmer

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trades in any single article so blindly, and with such a child-like confidence in the recommendations of others, as he does in buying commercial fertilizers. Would he buy a horse or a cow merely on the certificate of any hundred persons in the world who were entire strangers to him, whom he had never seen and of whom he had never heard? He might, it is true, be predisposed in favor of an animal so numerously recommended, but he would not buy it without seeing it. Why should he be any the less careful in buying fertilizers? It may be true that he does not buy a superphosphate often without seeing it; but he might stand and look at and handle it for hours without becoming any the wiser as to its richness in the plant food for which he purchases it.

Such a change as this which we desire will not come till the consumers call for it. As long as they are satisfied with testimonials dealers will provide them, for they cost nothing; and not till guaranteed statements of composition are demanded will they be given; and not till consumers take some pains to assure themselves that these statements are correct will all dealers be cautious, in making them, that they are correct. I think that when fertilizers are sold in this way there will be an improvement in their quality — not any wonderful improvement, such as doubling or trebling their value — but a sufficiently great improvement to justify the change. It might not be rash to say that superphosphates would, on the average, be two per cent better in soluble acid, and one per cent better in nitrogen. If two per cent better in soluble acid, that would mean twenty tons more of soluble acid in every thousand tons of the phosphate sold, which at twelve cents a pound would amount to $4,800. If one per cent better in nitrogen the increase in value would be about the same, nitrogen being estimated as costing from twenty to twenty-four cents a pound, if in a readily available condition. Just what the soluble phosphoric acid and nitrogen are actually worth to the farmer depends on circumstances. They would, undoubtedly, be worth more in some cases than we have allowed, and then the gain to the community in the improved quality of the fertilizers would be still greater.

It is in respect to the well established brands of fertilizers that we should expect only a moderate improvement in quality, for these brands must be tolerably good now or they would not be able to hold their place in the market. Probably each one of them is a favorite in certain localities and communities, and retains its footing by maintaining a certain character; but if a new comer should appear in the field with an article of better composition, and the composition of both the old and the new should be plainly stated on each package,

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the old would soon be crowded out unless it should come up to the standard of the new. As matters are now, the way to introduce a new fertilizer in any locality is to make a longer list of recommendations for it, which is easily done; it is as easily equaled by the older settler, and the result of the whole is, perhaps, no real improvement and no real gain to the consumer, whereas there would be by the new plan. But while the gain may be apparently small in respect to the standard fertilizers, it may be very large in the suppression of gross frauds, such as can and will be occasionally practiced on the farmer so long as the present system prevails of buying so largely on testimonials or on untested guarantee. That such frauds are practiced from time to time is generally known. Sometimes, where a chemist happens to light upon them, their true character is speedily exposed; as when Professor Johnson, less than two years ago, soon stopped the sale of a so-called composition for grass, which was made up mostly of sand with a little vegetable matter, and whose highest estimated value was about a dollar a ton while it was sold at thirty-five dollars. Such a miserable fraud would, of course, sooner or later, meet with its deserved fate, even without any aid from chemistry, but, very possibly, not till after two or three seasons, and till after some hundreds of dollars had been invested in it by over-credulous farmers — not perhaps till after money enough had been wasted on it to pay a good salary to an inspector of fertilizers for a longer time than it had taken to fully expose the fraud.

I need not take the time to prove to this audience that chemistry can do all this which I have claimed for it as its true and proper work in connection with the trade in commercial fertilizers; it is doing similar work all the time for laborers in other useful arts — in mining and in various manufactures — the manufacturers themselves of these fertilizers making free use of the services of the chemist. I have already shown by one or two instances, how largely this kind of chemical work is done in Germany and France; and I could show that in England the same dependence is placed upon chemical examinations of fertilizers, in order to keep them up to the highest standard of excellence; and the same feeling is making its way in some parts of this country, and especially in Georgia, where there is a more complete system of chemical examination—for the benefit of the public—of the fertilizers offered for sale in the state, than in any other part of the Union.

The main reason why farmers do not more frequently call for the services of the chemist is, undoubtedly, not because they do not have

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confidence in the results of his work, but because those services are generally expensive, and they do not sufficiently appreciate their importance to feel that they can afford such expenditure. In France and Germany the establishment of the experiment stations has opened the way for a more general resort to the chemical examination of fertilizers and other agricultural materials and products, by making it possible to do the work very cheaply. For instance, to a member of a farmers' club that assists in the support of an experiment station, the cost of the determination of soluble and insoluble phosphoric acid and water in superphosphate is but about two dollars; with nitrogen added two dollars and seventy-five cents; and with potash added to these three dollars and seventy-five cents. The determination of phosphoric acid and nitrogen in bone meal, all that it is needful to be determined in order to form an estimate of its value, costs but two dollars. As comp'ete an analysis of a soil as would ever be required for any practical purposes, including the silt-analysis, costs but ten dollars. The determination of the two most important constituents of a concentrated fodder-stuff, nitrogen and fat, costs only two dollars, and a complete analysis four dollars and fifty cents. The full professional fees for these determinations are but about twice as great as those charged to contributing members as just given. To any chemist in this country these prices seem remarkably low; the lowest terms upon which it appeared to me that we could do such work at the laboratory of the university, even for farmers of the state, who may perhaps be regarded as having some claim upon us, were somewhat higher than the full chemist's fees in Germany, and those are very much below the usual chemical charges in this country. If such uncommon facilities for calling in the aid of experts in the examination of fertilizers could be offered in this State, it could not but tell in a marked manner on the average composition of these articles of trade as offered for sale in the State.

In one other respect quite extensive use is made of chemical analysis by English, French and German farmers: I refer to the examination of some concentrated fodder-stuffs, and especially oil-cake. This material varies considerably in value, and can be, and is, more or less adulterated; but there does not as yet appear to be much occasion for such analysis here. Our American oil-cakes are uniformly the best in the English markets, as Voelcker has found from numerous analyses. We do not appear to have learned the art of adulterating them, or to have learned that it is profitable; and as I have already occupied so much time with the consideration of other matters that seemed to

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be more important, I may well leave this subject without further mention.

There are many ways in the practice of the useful arts, in which we may proceed for the attainment of useful results. We may follow in the ruts made by our predecessors, and get just as good returns as they did, but no better. We may strike out, hap-hazard, in new tracks, for a chance of doing something better than has been done before, but with the odds at least even against us; or, which is the true scientific method, we may take a new path indicated by theory, based on the results of scientific investigations. If we follow either of the courses indicated in the first two instances, neither experimentation nor chemical analysis can give us any service; but the intelligent and enlightened farmers of the present day are not satisfied to do simply as their fathers did, and the last method is the one that they adopt to a greater or less extent. To follow this course, means progress in agriculture. It is the surest course that can be followed for real and rapid progress, and it must be taken, if agriculture is to keep pace with her sister arts, in any state or country.

In this course the guidance and aid of these two handmaids, whose possible usefulness to agriculture I have made the subject of my theme, are absolutely indispensable, whether it be to furnish material for new theories of practice, or to test the soundness and practical value of our theories — to indicate to us the ways in which we may *possibly* improve our methods of working, and to help us to fix upon the ways in which we can *really* improve them. Let us all, then, in our respective stations, whatever they may be — whether in the field, the study, or the laboratory — keep these servants ever at work, so far as in us lies, for the advancement of that noble profession in which any man can find the fullest exercise for his best faculties.

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INDIAN CORN.

Paper presented by request at the Annual Meeting, January 22, 1879,

By E. LEWIS STURTEVANT, M. D.,
South Framingham, Mass.

The interest which surrounds an investigation into the history of a cultivated plant, increases with the importance of the uses to which the vegetable is applied, and the obscurity which prevails over the origin. There is a delight in probing within mysteries, and in the following out of clues which trace to mythology and the beginnings of things, especially when the value of the production lends a factitious dignity to everything connected with the investigation, and the fancy can play without the appearance of triviality, or the accusation of idle research. The corn plant eminently holds this relation to the student, as furnishing support to so many people of diverse nationalities, being cultivated in nearly every region of the globe, and furnishing to commerce such an important increment. In the year 1877, the product of Indian corn is given for the United States alone as 1,342,568,000 bushels, representing a value of $480,643,400. To move this crop at one time would require 3,356,470 cars, which would occupy at least 25,000 miles of track. As an actual fact, of this immense crop, 70,860,983 bushels were exported, constituting a greater value than any other one exported product save cotton and bacon alone.

Botany.

Indian Corn, the *Zea Mays* of botanists, is an annual plant of the order of grasses, characterized by its monœcious flowers, the male borne in a terminal panicle; the spikelet two flowered. The female flowers are borne in an axillary spike, and are enveloped in a number of leaf sheaths which answer to floral envelopes. There are very many, in fact, innumerable varieties, caused by climate, selection, cross-fertilization and cultivation. The plant may vary in its varieties, under certain conditions, from two feet to fourteen feet or more in height; it may contain a different number of nodes; it may normally develop ears from different nodes in different varieties; it is subject to variation, between varieties of leaf, size and number; some are more

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prolific than others; the maturity of varieties may vary from ninety to one hundred and twenty days, or more, etc. We also find variations in the characters of the seed and ear. Some bear short, others long ears; some ovoid, others tapering ears; some eight-rowed, others ten, twelve, sixteen, twenty, and even up to twenty-four and thirty-six rowed ears; some of the kernels are globular, others ovoid, others cone-shaped, some broader than long, others longer than broad, some narrow, others deep; these kernels may be flattened, pointed, toothed, indented, wrinkled or smooth. In color of kernel we have variations from pearl white, white, dusky, pale yellow, yellow, orange, copper-colored, red, purple, slate, black, and even variegated. In size one variety may produce a grain seven or eight or even sixteen or seventeen times heavier than that from another variety. In the arrangement of the structural portions of the kernel, we find variations from the pop-corn at one extreme, wherein the corneous matter is distributed throughout the whole mass, through varieties wherein there is visible starchy matter between the chit and the corneous portion, to kernels wherein there is no appearance of corneous matter. We find the grain of some varieties hard, of others softer; in still others a granular structure, and in sweet corn nearly gummy as taken from the plant at time of harvest, etc. And these and many other distinctions are characteristic of varieties, and are in the main transmitted with considerable constancy through the seed.

Within a variety we notice a facility of sporting which is remarkable. Through the influence of foreign pollen, the cob may bear kernels having every appearance of the variety which furnishes the pollen, as well as other kernels of intermediate color, shape and qualities. Grain may be borne on the tassel or staminiferous plume, and the stamens may appear on the cob, or the plume may be converted into an ear, and the ear into a tassel, although usually the two characters are combined in these cases. The plant may vary in its habit of growth, and become what is called branched; the ear may develop at nodes where it does not normally belong; the nodes, from which normally but a single ear proceeds, may bear two ears, or even in two cases we have observed, four ears have appeared at the upper node, which is normally barren of fruit; the cobs may produce a tassel of staminiferous bloom from their apex, the grain being found as usual in the basal portion; the ears may branch at their base, forming two, three, or even six ears; the branches may produce a terminal ear, and at the same time develop ears from their nodes, as we have in our

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collection three nodal and one terminal ear on a branch. The kernel also is subject to change of shape, and to change of structure. We have observed flint varieties rounded and dented, both kinds in the same cob, and produced without any apparent aid from cross-fertilization from a dent variety, but never as yet a true dent on a flint ear.

Bibliography.

The only books or essays on corn we have met with, or seen mentioned, worthy of record, are included in the list as given below. We here mention that, in our references to authorities in other than the English or French languages, we have been compelled to trust to others, but in nearly every case material is furnished by whose aid can be readily seen who is to vouch for the authorities:

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SYNONYMS.

As a matter of course, Indian corn has received various names in the different countries where it has been cultivated. We have collected the following:

Abyssinia	Mashela bah-ry, millet from the sea (Parkyns).
Africa, Central	Maheendee (Treas. of Bot.).
East, by the Wanikas	Mahindi (Krapf).
Northern	Masr (Barth).
Aztec	Elotl, when in the milk.
	Centli, the dried ears. (Bancroft.)
	Tlaoli, when shelled.
Belgium	Mays.
	Turkisch koorn. (Salisbury).
Burmah	Pyoung-boo (Mason).
Brazil, Portuguese	Zabuno.
	Milho de Guine. (Hans Stade).
	Milho (Treas. of Bot.).
Central America, Maya language,	Yxim (Norman).
Ceylon	Muwa (Moon).
China	Yii-shu-shu, jade sorgho (Bretschn.)
	yuh-kau-liang.
	pau-kuh. (Smith).
	At Pekin, yuh-mi.
	In Southern provinces, pau-suh.
Dardanelles	Kalamasitaro, reed wheat (Forskal).
Egypt	Dourah de Syrie (De Candolle).
	Doura Shammy, Syrian Millet (Parkyns).
European Voyagers	Guinny wheat (Masham, 1596).
	Millet of Brazil (Cartier).
	Maez (De Soto).
Feejee Islands	Sila ni papalagi (Seemann).
Formosa	Fan-meh, foreign corn (Smith).
France	Le mais. (Loudon).
	Ble de Turquie.
	In Lorraine, and the Vosges, Ble de Rome (D C.).
	In Provence, Ble de Barbarie (D C.)
	Ble de Guinne (D C.).
	In the Pyrennees, Ble de Espagne (D C.).
Germany	Der mays (Loudon).
	Turkischer koorn, (Salisbury).
	Turkischer weizen (Adler).
Greece	At Athens, Arabositi, Arabian corn (Sibthorp).
India	In Bengalee, mokka (D C.), makkai (Dutt), mukka (Firminger).
	In Hindustanee, bhotta (D C.), bhoot (Firminger). muk-jowaree-boota (Graham).
	In Telinga, mokajuna (D C.).
Italy	Gran Turco (Loudon).
	Grano d'India. (Salisbury).
	Grano Siciliano.
Japan	Nanbamthbi, foreign corn (Heller).
	Sjo Kuso (Kaempfer).
	Too Kibbi (Thunberg).

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Malays	Jagong, indigenous (Crawford).
Mexico, ancient	Tluolli, (Clavigero).
	Tlaolli (Heller).
Moldavia	Kuku-rusa (Pallas).
North American Indians:	
Abenakies	Skaman (Father Rasle).
Adaize	Ocas'.ck (Sibley).
Algonquin	Mitamen (La Houtan).
Attacapas	Neahowm (Duralde).
Caddoes	Kisheeee (G. Gray); Kishwanto (Ib).
Cahuillo	Pa-ho-with-lim (Whipple & Turner).
Camanche	Hunibist (W. & T).
Canada Indians	Carracony (Cartier),
Catawba	Koos (Miller).
Cherokee	Kungwisitung (S. A. Worcester).
	Aloo (Bordinet).
	Selu (Worcester).
Chemehuica	Hahwib (W. & T.).
Chemehuevi	Hahwib (W. & T.).
Chetimachea	Kaseman (Duralde).
Chicasa	Tuncha (Gallatin).
Chippeway	Mittawmin (Heriot).
	Mandamin (Keating).
Choctaw	Tanchi (W. & T.); Tonche (A. Wright).
Coco Maricopa	Ter-ditz (W. & T.).
Coosaw	Mayze (Flint).
Cuchan	Ter-ditch (W. & T.).
Dacotahs	Wamunuyzah (Cass).
Delaware	Husquim (W. & T.).
	Khasquen (Am. Antiq. Soc).
Illinois	Micipi (Duponceau Collection).
Keres	Yaoca (W. & T.).
Kroway	E-tahl (W. & T.).
Knistinaux	Mundaninuck (Harmon).
Lenni-Lenape	Lenchesquim, (Flint).
Long Island	Sowhamen (S. Wood).
Maricopa	Terditz (Bancroft).
Massachusetts	Eachimneash (Elliott).
Menonemies	Waupimmeenuc (Doty).
Miamis	Mentsheepeh (Thornton).
Mohawks	Onuste (Parish).
Mojave	Ter-di-cha (W. & T.).
Muskhogee	Atshi (Gallatin).
Narragansetts	Ewachimmash (R. Williams).
Natchez	Hokko (Gallatin).
Nottoways	Ohnehahk (Wood).
Omahas	Wattanzee (Say).
Oneidas	Ohuloto (Jefferson).
Onondagas	Onatschia (Zeisberger).
Osages	Wautauchee (Cass).
Ottoes	Watooja (Say).
Passamaquoddy	Piaskomin.
Pawnee	Task (W. & T.).
Penobscot	Scamoon.
Pima	Ou-in (W. & T.).
Quappas	Wah tonseh (Izard).
Quonnetiquots	Wia chin (Flint).
Saukies	Tamin (Keating).
Seneca	Onaa (Parish).
Shawnee	Tarmi (W. & T.)
	Dame (Johnston).
	Tami (Jefferson).
Utchees	Ptsothoh (Ware).
Virginia	Pagatour (Heriot.)
	Poketawes or pokotawes (Strachey).
Winnebagoes	Wachoas (Long).

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Woccon	Cose (Arch. Am.).
Wyandotte	Nay, hah (Arch. Am.).
Zuni	Mi-we (W &. T.)
Paraguay	Abati (Dobrezhoffer).
Persia	Ghendum i Mekka, wheat from Mecca (Bretschn.)
Peru	In the Inca language, Sara; in the Callao dialect, Tonco; varieties, muruchi and capia (De Vega).
Portugal	Milho da India, Milho grande (Salisbury).
Russia	Tureskorichljeb, (Salisbury).
Sennaar	Eysh reef, Egyptian Millet (Parkyns).
Servia	Cucuruz (Mackenzie).
South American Indians:	
Maco	Niarne. }
Maypure	Jomuki. } (Humboldt).
Pareni	Cana. }
Salive	Giomu. }
Spain	Maiz (Loudon).
	Trigo de Turkuia (Flint).
	Zara, (Treas, of Bot.).
Sweden	Turkish hvede } (Salisbury,.
	Korn }
Tartars	Missir bodai, Egyptian corn (Pallas)
Turkey	Misrbogdag, Egyptian wheat (Klippart).
West Indies	Mahiz (Gomara).
	Maiz (F. Colombo).

I. AMERICAN HISTORY.

ANTIQUITY OF ITS CULTURE.

The mere fact of the great variability of the corn-plant, and its pliancy of habit which has given it an adaptiveness to so many regions of varying climate, is sufficient evidence of the antiquity of its culture; and, we might add, that it is uncertain whether any truly wild variety is known to exist, as, to say the least, there seems no evidence that the so-called wild varieties are other than cultivated varieties escaped from cultivation. A peculiar kind, in which each grain, instead of being naked, is concealed by a husk, has been stated, on insufficient evidence, as Darwin (1) observes, to grow wild in Brazil; but Professor Gray states that this species produces from its seeds either the common or the husked maize, as I have myself verified. A cut of the so-called wild corn, said to be found growing "in the Rocky Mountains of North America, and down to the humid forests of Paraguay," is to be found in the United States Patent Office Report for 1853 (page 98), and another cut, evidently of a different variety, under the name of Oregon, California, or wild corn, said to have been introduced from Oregon, California, Mexico and South America, is given in Agriculture of Ohio, 1858 (page 524), and these cuts would seem to indicate a variability scarcely consistent with the claim of a species for the two.

When the fact is taken into consideration, that those plants which are the most sportive in cultivation are apt to be those whose origin is known to extend to a very remote antiquity, and which have become

(1) Darwin An. and Pl., under Domes, N. Y., 1868, i. 886.

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fitted through their adaptiveness of character to conditions of culture in regions far apart and dissimilar in climate, we are prepared to grant that the probabilities of corn being a most anciently cultivated plant are very strong, and we, for our part, should not anticipate the corn-plant ever being found truly wild, as we must believe that it has been modified so greatly from its original source as not to secure usual recognition. Indeed, we know from our own experiments, that the removal of a corn-plant from the normal conditions by mechanical interference about the growing plant, increases the tendency of the plant to vary, and is productive even in one generation, of a manifest departure from the variety planted; and we believe we have noticed indications of changes which would lead to the inference that by a systematic planting of seed selected for its pure quality, a few generations of culture would secure differences from any one starting point as great as now exist between the so-called wild corn and the cultivated varieties.

Be this as it may, we have absolute evidence of the culture of corn in America extending beyond the historical period, in the charred corn-cobs which have been taken from Indian mounds;(3) in the corn itself, two varieties of which were taken from tombs in Peru, apparently prior to the dynasty of the Incas,(4) while Darwin (5) relates that in the northern part of Chili, within the Cordilleras, heads of Indian corn are not unfrequently upturned in digging among the ruins of the old Indian houses in places where the modern inhabitants do not abide; still more emphatic is the evidence of antiquity in the finding of the head of a stalk of Indian corn identical in appearance with similar relics taken from out of the Huacas or old Peruvian tombs, *embedded* amidst the shells and much-drifted sea-rubbish on a terrace eight-five feet above the sea,(6) occurring with bits of cotton thread and plaited rush. Were further evidence required, it may be found in an ear of corn (7) in the possession of the Smithsonian Institution, found deposited in an earthen vessel eleven feet under ground, in a grave with a mummy, near Arequipa, in Peru.

A most striking observation in regard to this last-mentioned ear of corn is that the grain is irregularly disposed on the cob in thirteen rows, suggesting the thought that at this early period the habit of the

(3) U. S. Dept. Ag. Rept., 1870, p. 420.
(4) Tschudi. Travels in Peru. Eng. Trans., p. 177.
(5) Voyage of a Naturalist. Harper's ed., 1859, ii, p. 117.
(6) Darwin, ib. ii, p. 135.
(7) U. S. Dept. Ag. Rept., 1870, p. 420, where it is figured. See, also, Lapham's Antiquities of Wisconsin, for reason to think corn was cultivated by a race preceding the Indians.

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corn-plant in bearing rows in a number always divisible by two, had not as yet become so strongly fixed as at present.(8) We would also impress attention to the circumstance that two varieties are mentioned as being found by Tschudi. Gonçalo Ximenez, in describing the corn of New Granada, speaks of two varieties, a coarse and a fine, the latter called *morocho*. Jos. de Acosti, in his natural history of the West Indies, says, there are two sorts, one large and substantial, the other small and dry, which they call *morochi*. The Inca Garcilasso de la Vega, in treating of the products of Peru, mentions two sorts, one called *moruchu*, which is hard, and the other *capia*, which is tender and fine. Clavigero, in describing the grains of Mexico, says the Indians had several varieties, the large and the small sorts, the white, the yellow, the blue and the black. The corn at present cultivated about the Pueblas of New Mexico and Arizona, now as formerly, varies in color through shades of pink, blue and white. In his account of the Indians given to the Royal Society, of which he was a member, Mr. Winthrop says the corn is of various colors, such as red, white, yellow, blue, olive, greenish-black, speckled, striped, sometimes in the same field and in the same ear. Higginson, in "New England's Plantation," says also of corn, that there are of "varietie of colours — as red, blew and yellow," etc. Josselyn also says, "Indian wheat, of which there is three sorts — yellow, red and blew. The blew is commonly ripe before the other" (Rareties, p. 83); and this for the Indians of the Northeastern America. A distinct variety noted for its earliness was cultivated by the Mandans of the northwest; other and distinct varieties by the Indians of New York, and the Carolinas, etc.

According to Flint,(9) at the old ruins of Copan and Central America, are found paintings and statuary ornaments of maize, and De Candolle also states that a variety of maize has been found on an ancient Peruvian sculpture. Less certain evidence is in the stone pestles, which are dug up from Indian haunts, and from the mound regions of the west.(10)

When the early voyagers reached the shores of America, they found the corn-plant widely distributed and under cultivation by the

(8) We examined an ear of mummy corn, December, 1878, which was in the possession of Professor Goodale, of Harvard University. The grains were irregularly arranged upon the cob, somewhat spirally, and of uncertain count. We made fifteen, fifteen and seventeen rows (odd numbers, observe) in three different counts on different segments of the ear, but on account of the irregular arrangement, we could not convince ourselves whether this was an actual or but seeming fact The kernel differed in shape from our common varieties no more than our varieties differ among themselves.

(9) Agr. Of. Mass., 1858, p. 52.

(10) See Smith. Reports, Passim.

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aborigines, who, indeed, gave lessons for its growing to the European colonists.(11) Columbus found it on the Island of Cuba and other points; Vasco Nunez, in Guiana; Navarez and De Soto, in Florida; and Gonçalo Ximenez, in New Granada, the latter of whom says that it furnished the principal food of the inhabitants, and bore very large and weighty spikes or ears, each generally yielding 700 grains, a bushel of which when planted in warm moist land, frequently produced 300 fold (12); others of the earlier historians and writers, as P. Martyr (13), Ercilla (14), Jean de Levy (15) and Torquemada (16), tell us that the first Europeans who set foot on the New World saw the maize. Bernal Diaz (17), the author of "Conquest of Mexico," says "the country produces maize, red pepper and many other things." Garcillaso de la Vega, one of the earliest Peruvian historians says, that the palace gardens of the Incas were ornamented with maize in gold and silver, with all the grains, stalks, spikes and leaves, and in one instance we are told that there was in "the gardens of gold and silver," an entire corn-field of considerable size, representing the maize in its erect and natural shape.(18)

Our Puritan fathers found corn in abundance on the New England coast, wherever they landed.(19) The Sieur de Champlain in navigating along the coast, found cultivated corn-fields in 1605, at the mouth of the Kennebec river in Maine, at Cape Cod, and "much land well tilled in corn" farther south. When Cartier visited Hochelaga, near Montreal in 1535, he found that town situated in the midst of extensive corn-fields.(20) The Five Nations made planting of corn their business before the French arrived in Canada, in 1603.(21) At first the Swedish settlements at New Jersey and Pennsylvania were obliged to buy maize of the Indians for sowing

(11) U. S. Pat. Of. Rept. 1853, p. 98. Other authorities could be given.

(12) D. J. Browne, quoted Trans. N. Y. Ag. Soc., 1848, p. 681. See, also, Alvar Nunez Cabeca de Vaca, Relation; Disc. and Conquest of Florida by De Soto; F. Colombo, in Hakluyt's Voyages, etc.

(13) De Orbe novo de decades, 1516, iii.

(14) Alonzo de Ercilla, Araucana, Madrid, 1577.

(15) Historia d'un voyage fait en la terre du Bresil, 1723.

(16) Della Monarquia Indiana, tom. i, 158.

(17) Writing some fifty years after the Conquest.

(18) Prescott gives as authorities: Garcilasso, Com. Real pl 1. lib. 5, Cap. 26; Lib. 6, Cap. 2. Also Sarmento, Relacion Ms. Cap. 24. Cieza de Leon, Cronica, Cap. 94.

(19) Morton New England's Memorials. Boston, 1826, 68. Gooken, Mass., Hist. Collections, chap. iii. See, also, Bradford Hist. Plym. Plant. 82, 100. Mourt's Relation; Wood, New Eng. Prospects; Roger Williams' Key, etc.

(20) John Delafield, Trans. N. Y. Ag. Soc., 1850, 886.

(21) Colden's Hist. of the Five Nations, London, 1747.

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and eating as Kalm writes, and Indian corn was also found as a common food when Europeans first landed at New York.(20) It was cultivated in extensive fields there as well as inland, as the French army under Frontenac, in 1696, spent three days in August destroying the growing corn of the Onondagas.(22) Corn was also found in cultivation by the Indians about James river in 1607, when the colonists sent over by the "London Company" took lessons from them of its culture — the first attempt by Europeans that we find recorded.(23)

We have thus far referred to the periods since the discovery by Columbus, and to monumental records. We might increase our references quite readily, as we have by no means exhausted our material. More interesting and important, however, are the pre-Columbian mention. Thus in 1002, Rafn, sailing from Greenland westward, Thorwald, brother of Lief, reached the wintering place in Vinland. The following season, on an island far westward, "met with a wooden Kornhjalmr" (corn shed?), but saw no other signs of inhabitants (Pickering). In 1006, Karlsefne sent out two Scots people to explore on the coast of Massachusetts (?), when they returned they brought back a bunch of grapes and a new sowen ear of wheat.(23') At Hop, supposed by Prof. Rafn to be in the vicinity of Taunton, Mass., "they found there upon the land self-sown fields of wheat, there, where the ground was low, but vines there where it rose somewhat."(23'') In or about A. D. 1250, in the reign of Nopaltzin, King of the Chichimecs, the culture of maize and the art of making bread, long neglected and in danger of being lost, was revived by a Toltec named Xinhtlato (Humboldt. Atl. Pict.). As corroboratives to the Icelandic Sagas, we find Adam of Bremen, in the 11th century, citing corn as growing in America to perfection.(23''')*

(20) Doc. Hist. New York, i, 212.

(22) U. S. Pat. Of. Rept. 1854, 18. Jefferson's notes on Virginia. See for culture in Louisiana, Du Pratz's Hist. de la Louisiana; Paris, 1758, ii. 176. In Colorado's Castanedo's Relations (in 1540). Cabeca de Vega's Relation, 1528–1536 for Florida, Texas, etc. In New England, Young's Chronicles of the Pilgrims, 231.

(23) *Voyages of the Northmen to America. Prince Soc., Pub.*, p. 51. (23') *Ib.*, 54.

(23'') *In Copenhagen. Nord. oldskr. Selsk. Antiq. Amer.*, 1847.

* NOTE.— The Indians of New England stored their maize under ground, so far as our reading extends; at Hochelaga, the present Montreal, however, Cartier found the corn stored in granaries over the houses. If Hochelaga was the "island far westward," the northmen would have found perhaps "Kornhjalmr," as customs change slowly, and the other conditions found in the St. Lawrence river would seem to satisfy the identification of the locality visited by the northmen as well as any other place.

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MYTHOLOGY.

Were we unacquainted with any of these facts, yet would we have evidence of its ancient cultivation, and a hold upon the American aborigines which it must have taken time to secure, in the sacred associations which were connected by them with it. Not only was it a sign in the calendar among the ancient Mexicans, and a holy ornament upon their graves (34), but they had a goddess who presided over this production, who was called To-na-cay-ohu-a, which means "she who feeds us." To her they consecrated the first fruits of the earth as the heathens did to Ceres. (35)

Other authors name the goddess Cinteute, and state that she derived her name from that of maize, "Cintli," and received the first offerings of the maize harvest.(36) We also learn(37) that a tradition existed that when the beneficent god Quetzalcoatl, the god of the air, resided upon the earth, the land teemed with fruit and flowers, without the pains of culture, and that an ear of corn was as much as a man could carry.

The Peruvians, as well, introduced maize into their religious festivals. During the high feast *Capacraqui*, held in the first month, *Raymi*, agreeing with our December, no stranger was supposed to lodge in Cuzco, to which they again all assembled as soon as the festival was over, to receive cakes made of maize, etc. In the beginning of the month *Hatuncuzqui*, which corresponds to our May, the Peruvians gathered their maize, and kept the feast *Aymorai*. They returned home, singing from the fields, carrying with them a large heap of maize, which they called *Perua*, wrapping it up in rich garments. They continued these ceremonies for three nights, imploring the *Perua* to preserve their harvest of maize from any danger, etc.(38) The corn-stalks with many ears or with double ears were considered by the ancient Peruvians as sacred things, but not as deities; they were called by the Indians *Huantazara* or *Aryhuazara*, because they danced with them the dance *Arihuay* when the corn was suspended by branches of willow; in the same way did they worship the ears, the grains of which were of various colors, or were arranged in rows united in the shape of a cone.(39)

(34) H. Carl Heller U. S. Pat. Of. Rept. 1847, 411.

(35) Jos. de Acosti's Nat. Hist. of the West Indies, lib. 4, chap. 16, p. 236, quoted in Trans. N. Y. Agr. Soc. 1848. 689.

(36) J. Brendel. Trans. Ill. Agr. Soc. 1856–7, 473.

(37) Prescott's Conquest of Mexico, i, 59.

(38) D. J. Browne, quoted in Trans. N. Y. Agr. Soc. 1848, 690.

(39) *Rivero and Tschudi, Peruvian Antiq.*, 179.

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The North American Indians have also their traditions concerning its origin, not unmixed with mythological interest. The Western Indians believe that on a certain occasion the Great Spirit descended to the earth in the form of a beautiful squaw, and that when she first touched the ground with her feet, there sprang up the Indian corn. Another tradition is that the first grain of corn was brought to them by a black bird. The most beautiful of them, however, is that of the Odjibwas, which, as given by Mr. Schoolcraft, deserves a full quotation:

"A young man went out into the woods to fast at the period of life when youth is exchanged for manhood. He built a lodge of boughs in a secluded place, and painted his face of a sombre hue. By day he amused himself in walking about, looking at the various shrubs and wild plants, and at night he lay down in his bower, which, being open, he could look up into the sky. He sought a gift from the Master of Life, and he hoped it would be something to benefit his race. On the third day he became too weak to leave the lodge, and, as he lay gazing upwards, he saw a spirit come down in the shape of a beautiful young man, dressed in green, and having green plumes on his head, who told him to arise and wrestle with him, as this was the only way in which he could obtain his wishes. He did so, and found his strength renewed by the effort. This visit and the trial of wrestling were repeated for four days, the youth feeling at each trial that, although his bodily strength declined, a moral and supernatural energy was imparted which promised him the final victory. On the sixth day his celestial visitor spoke to him. 'To-morrow,' said he, 'will be the seventh day of your fast, and the last time I shall wrestle with you. You will triumph over me and gain your wishes. As soon as you have thrown me down, strip off my clothes, and bury me in the spot, in soft, fresh earth. When you have done this, leave me, but come occasionally to visit the place to keep the weeds from growing. Once or twice cover me with fresh earth.' He then departed, but returned the next day, and, as he had predicted, was thrown down. The young man punctually obeyed his instructions in every particular, and soon had the pleasure of seeing the green plumes of his sky-visitor shooting up through the ground. He carefully weeded the earth and kept it fresh and soft, and in due time was gratified by beholding the matured plant bending with its yellow fruit, and gracefully waving its green leaves and yellow tassels in the wind. He then invited his parents to the spot to behold the new plant. 'It is mondamin,' replied his father, 'it is the spirit grain.' They immediately prepared a feast,

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and invited their friends to partake of it, and this is the origin of Indian corn."(28) In speaking of the Indians of New England, Roger Williams writes that they have a tradition "that the crow brought them at first an Indian grain of corn in one eare, and an Indian or French beane in another, from the great God Kautantouwits field in the south-west, from whence they hold, came all their corne and beanes."(29)

II. EUROPEAN HISTORY.

There is a certain significance in language to trivial names, and hence it may not be out of place, in studying the European aspect of the history of corn, to see whether, in the popular terms, we cannot obtain a clue to the direction of its distribution. We must bear in mind the danger of this course leading us into error, if we ask more of it than this.

Notwithstanding Gerard, after describing in his "Herbal" several kinds of Turkey wheat, evidently varieties of maize, goes on to say that "these kinds of grain were first brought into Spain, and thence into the other provinces of Europe, not (as some suppose) out of Asia Minor, which is the Turks' dominions, but out of America and the islands adjoining, as out of Florida and Virginia, or Norumbega," etc.; and notwithstanding M. E. Discourlitz says directly that maize was brought into Europe by the Spaniards from Peru, and Matthioli in 1645 affirms that Turkish wheat is not a proper name for maize, but that it should be called Indian wheat because it came from the West Indies, and not from Asia nor from Turkey; notwithstanding these and other statements to like effect the Turkish possessions seem to have given name to maize in many different countries. Thus, the common name not only in Spain, but as well in Belgium, France, Germany, Greece, Italy, Russia, Sicily and Sweden, would indicate that it was received from the Turkish provinces; we would also infer that Italy received it from Sicily and American or West Indian derived seed as well; France from West Indian, Spanish, Italian and Northern African sources; Sicily from seed derived from America as well as Turkey; Central Africa from Egypt. Curiously enough, after this list, Turkey seems to refer back to Egypt for her supply; Egypt, according to Delisle, has a tradition that the plant was received from the north by the way of Syria and Turkey, and Portugal alone of

(28) See Longfellow's beautiful versification of this story in "Hiawatha," Canto V, entitled, Hiawatha's Fasting. Read, also, in continuance, Canto XIII, Blessing the Corn Fields.

(29) *Key to the Language of Am., Lond.*, 1645. *Narragansett Club Ed., p.* 144.

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European countries would seem to have derived her seed from the West Indies in a manner which impressed the name of this locality as a proper one for distinguishing this cereal. From this list, the only certain conclusion that we can draw is, that Indian corn reached Northern and Central Europe, perhaps Southern Europe, through the countries bordering on the Mediterranean, but not probably from any one distinct center for this distribution; but whether these centers were Spain, or Asia Minor, or Africa, this method of investigation does not seem sufficient to furnish intelligible answer. Let us not fail to remember, however, that all times are not equally propitious for the dispersion of seeds or commodities; that some periods of the world's history are distinguished by conservatism and seclusion, are ages wherein social and physical barriers are everywhere to be found to hinder expansion, and intercommunication between adjoining districts, even if by chance a local activity should develop; that there are other ages in which every nation seems brimming with that activity which leads to adventurous schemes, and which tends to distribute useful products over wide regions. Hence such a useful cereal as corn might for a considerable space be confined for its knowledge and culture within a determinate locality, from whence under propitious circumstances, it might spread with a rapidity which history cannot follow. We see illustration of a parallel nature in the history of vegetables and fruit, which, although cultivated for long periods in certain portions of the world, are unknown in other neighboring regions until an Alexander, or some other less famous man, alike the product of a local activity and aggressiveness, breaks down barriers and carries his own restlessness to act as a leaven throughout adjoining regions. We see in the great wars of Greece and Persia, and in the Crusades, a means for civilization which acted to equalize the possessions of distant countries, and to convey between divers people a knowledge of foods and luxuries before unknown. As a conception merely, it is no more difficult to suppose that corn could have been confined in its culture to some local point in Asia or Africa, and that its dissemination should have been delayed for years or for centuries, than to suppose that the peach could have existed in Persia for an unknown period, without having passed into Europe, or that the cherry should have awaited the coming of a Lucullus before it left Pontus for Italy; or to come to the present time, that mustard cress which occupies such a position in the London market, and which is so grateful to the English people, is as yet not classed among our market products. Difficult and easy to overcome, but who can fore-

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tell the habits, the tastes and the prejudices of a people, and hence, even at the present day, the dissemination of new products for cultivation is considered the province of a government or of societies, so great the risk of failure and so small the chances for success. Had not circumstances given us the history of the potato, it might have logically been supposed to have existed for years, an obscure plant in gardens or fields, before its good qualities became recognized, and before it became distributed. Thus the potato is recorded to have been in cultivation in Peru in 1509 ([30]), and in the sixteenth century ([31]) was so common in Italy as to be fed to animals, yet it was introduced into German cultivation really only in 1650, did not get a hold in the field culture of England until 1684, and did not reach Scotland, where it is now so extensively grown, until the year 1728.([32]) We cannot hence logically claim that corn must have been immediately adopted into cultivation upon its discovery, and we must not accept the argument for its novelty, in its rapid extension during those years of activity, both national and individual, which coincide with and followed after the discovery of America by Columbus.([33])

It would be curious, indeed, if the voyages of the old Northmen, which are now known to have extended to America, should have brought back samples of a grain which, unsuited to their climate, could scarcely have been preserved, and yet which might have secured a foothold in some favored locality bordering on the Mediterranean, and which only secured dissemination through the activity of communication, and revival of enterprise, which followed upon the discovery of the New World, when the minds of mankind were ripe for whatever was novel, and when old prejudices were being actively exchanged for new ones. We find Adam of Bremen, in the eleventh century, and Lief, in 1006, reaffirms this fact, citing *corn* growing in America to perfection,([34]) and this was during the period of the surprising activity of the northern nations, whose people, as pirates or adventurers, had frequent communication with the Mediterranean coast, and when the

([30]) Acosta. Nat. and Moral Hist. of the Indies. Seville, 1509.

([31]) Bowles. Nat. Hist. of Spain.

([32]) M. Drouhyn de Luhys. Address before the Society of Acclimatization, 1867.

([33]) For the necessity of these illustrations and observations, we can refer, among others, to Prescott, who in his "Conquest of Peru," writes: "The misnomer of Blé de Turquie shows the popular errors. Yet the rapidity of its diffusion through Europe and Asia, after the discovery of America, is of itself sufficient to show that it could not have been indigenous to the Old World, and have so long remained generally unknown to them."

([34]) Littell's Living Age, Dec. 10, 1873, p. 764; Voyages of the Northmen, Prince Soc. Pub.

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Varangians held the keys for the Greek emperors at Constantinople, while others of these corsairs pressed forward into the west.

Let us here collect the evidence which has been presented, as seeming to imply that Indian corn was known to the Old World prior to the voyages of Columbus.

An old map, called the Chart of Incisa, of the thirteenth century, describes a grain of a golden color, and partly white, under the name of *meliga;* and Crescenzio, a century before Columbus, describes the method of cultivating this grain, which is very nearly the same as that of cultivating maize at the present day. On the authority of this map, many authors affirm that it came from the east, such as Sismondi,(34) M. Michaud,(35) Gregory,(36) Lonicer,(37) Amoreux,(38) Reynier,(39) and Daru.(40) A Portuguese writer, Sata Roza de Viterbo,(41) infers from a deed of the year 1289, that maize was known in Portugal. The deed reads as follows: "Bequeathed to Stevan John of Perafita, or to his heirs, one quarter of milhom." Crusaders are said to have brought, in 1204, from Asia Minor to Italy, a purse full of grains of a golden color, and partially white, which they called *meliga*, as we learn from the Chart of Incisa: now Cardan,(42) in the sixteenth century, says that the wheat cultivated in America, called maize, resembles in habit the plant called, in Italy, melica or sorghum; and George de Turre, 1685, says that the maize, or Turkish wheat, *imported since a few years in* Italy, has a stalk resembling that of the *meliga* or sorghum,(43) Bonafous informs us that, according to some Spanish authors, maize was brought into Spain by the Arabs. Bock, the first botanist who wrote of it forty years after the discovery of America, asserts that it came from Arabia.(44) Ruellius maintains the same opinion.(45) Fuchsius also declares that it came from Asia to Greece, thence to Germany.(46)

(34) Biographie Universelle. Tom. xxix, 542, note.
(35) Historie des Croisades (4th ed., Paris, 1826), iii, 348-9.
(36) Annales de l'Agriculture Francais.
(37) Naturalis Historiæ Opus Novum. Frankfort, 1551.
(38) Memoir sur le Mais. 1874.
(39) Feuille d'Agriculture du Canton de Vaud, vii.
(40) Republic of Venice.
(41) See Valcarel. Agric. Gen. y gobierno de la casa del campo. Valencia, 1768. (From 34 to 40, copied from Flint's Essay.)
(42) De Subtilitate, lib. xxi, p. 389. Basle, 1553.
(43) F. Brendel, Trans. Ill. Ag. Soc. 1856-7, p. 471.
(44) Bonafous Hist. Nat. du Mais, p. 11.
(45) De Natura Stirpium, lib. xi, c, xxix, p. 428 [1536].
(46) De Historia Stirpium, 1542, pp. 824, 825.

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We thus find that the investigations of many writers are in accordance with what we might infer from the vernacular names applied to maize in the different countries. We also note that the date, 1204, is surprisingly close to that assigned to the restless activity of the Scandinavians. The Saga which furnishes a history of Northern Europe from about the time of the Christian Era to 1177, mentions Viking expeditions to all parts of the world, including the discovery of North America;(47) in 986, the Northman Bjarni discovered the wooded portions of the American coast;(48) in 1000, Erike wintered at Vinland, now supposed to have been in the vicinity of Rhode Island and Massachusetts; and, according to another Saga, Karlsefne's expedition to Vinland was in A. D. 1007. We also find evidence in a Runic inscription deciphered in Greenland, that communication with the American continent was continued till as late certainly as 1135. We have then for dates, the discovery and communications with the American coast from 986 A. D. to 1135 A. D., the presence of Northmen in Constantinople, in Russia and southern regions, and a spirit of enterprise pervading the sea and land from the Baltic to the Euxine for a few centuries preceding the Crusades,(49) and the asserted introduction of *meliga* by Crusaders. These connections are not very close, nor are they sufficiently well defined to be claimed as history, but they seem suggestive in the face of the certain existence of corn growing throughout America, its non-existence, or non-extension rather, through Europe until the discovery of Columbus in 1492, and the asserted references to grain, supposed to be corn, on insufficient evidence perhaps, but none of which precedes the voyages of the Northmen to America, and the known communication of the northern races with the inhabitants of the Mediterranean coasts.

We could, unquestionably, find other references to a grain supposed to be maize, but we will content ourselves with but two: De Herbelet,(50) the well known Orientalist, mentions a passage of Mirkond, a Persian Historian, which might lead us to suppose that maize was known to the Old World before the sailing of Columbus. Klippart,(51) however, says that this passage does not refer to maize. "It relates that Khozar, son of Japet, caused to be sown on Volga's banks (the region frequented by Northmen descendants, observe) some *kaveres*, a kind of corn, which the dictionaries render by millet,

(47) Enc. Brit., 8th ed., xix, 690.
(48) Enc. Brit., 8th ed., xviii, 162.
(49) Milman's Gibbons' Rome, Boston, 1850, v. 422–426.
(50) Bibliotheque Orientale, 1778, iii, 137.
(51) Agr. of O., 1858, 499.

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yellow millet, millet of Katay; and that Rous, Khozar's brother, caused to be cultivated on Volga's islands the *borgon*, which signifies, according to the same dictionaries, a kind of hollow tree from which flutes are made." The second author, who speaks decisively, is Rifaud, who, in his "Voyage en Egypt," etc., states that he found the "grains and ear of maize within the tomb of a mummy at Thebes in 1819. M. Virey, however, in the Journal de Parmacie, shows that this grain, called maize by M. Rifaud, was the *Sorghum bicolor*, which, according to Delisle, is a native of Egypt."(52)

It does not seem proper to pass without notice the statement of Bonafous, that the Treatise of Natural History, by Li-chi-tchin, written towards the middle of the sixteenth century, marks the existence of the maize in China; yet the *fac simile* of the ear from which this opinion is derived, does not show conclusively to our mind that it was not intended for a millet, but that it rather was, although we confess to a difficulty to account for the lines of the picture, which perhaps represent silks.

Very ill-grounded, also, seems the opinion of those who believe that they recognize maize in plants mentioned by Homer,(53) as well as by Theophrastus,(54) and those who lay stress upon the frequent allusions in the Bible to a product or plant translated corn.(55)

Let us summarize the opinions of authorities, first as to its eastern origin: Bock, 1532; Ruellius, 1536; Fuchsius, 1542; Sismondi, Michaud, Gregory, Lonicer, 1551: Amoreux, Regnier, Viterbo (Valcarcel), Donicer, Taberna-montanus, Bonafous, St. John, George de Turre, Daru, De Herbelot, Klippart.

This is indeed a formidable list of learned men, and it therefore seems desirable to transcribe the definition of *meliga*, upon the interpretation of which many of the above writers have founded their opinion. According to Klippart, Cardan, in the sixteenth century says that the wheat cultivated in the Western Indies, under the name of *mais*, approaches by its stature the plant designated in Italy by the name of *melica* or *sorghum*. Casper Bauhin, at about the same time, said that the Lombards named *melaga*, the plant known as *saggina* in Tuscany. Matthioli assures us that the plant known under the name

(52) Trans. N. Y. Agr. Soc., 1848, 680.

(53) Odyssey, lib. iv, verses 41 and 604.

(54) Historia Plantarum, lib. viii, c. 4.

(55) 2d Kings, iv, 42; Job, xxiv, 24; Leviticus, ii, 14, and xxiii, 14; Deut. xxiii, 24 and 25; Gen. xli, 5; Matt. xii, 1; Ruth, ii, 14; Sam. 17, 28. See, also, Pliny, Nat. Hist., lib. xxvii, c. 7; also, Didorus Siculus.

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of *melega*, was called *melica* in Lombardy; *saggina* in Tuscany; *sorgho* in many regions of Italy. George de Turre, an Italian botanist of the seventeenth century, says the maize or Turkish wheat imported into Italy a few years previously, produced a stem similar to that of the plant named *meliga* or *sorghum*. The Academicians of Cuesca, whose authority bears a great weight in regard to language, render in their vocabulary the Italian word *meliga* (in Latin *melica*) by *saggina*. Targioni-Tozzetti, author of a botanical dictionary justly esteemed, translates the words *Holcus sorghum*, L. by *meliga*, *melica*, *melliga*, *miglio*, *indiano*, *panico indiano*. It is only in the Piedmontese dialect that the name *melia* or *meligo* is given both to the *Zea* and *Holcus*.

The authors who ascribe to corn *Zea Mays*, L. an American origin are also numerous, and embraces the names of many individuals whose authority should have great weight: Dodonæus, 1583; Camerarius, 1588; Matthioli, Gerarde, Ray, Parmentier, Discourlitz, De Candolle, Humboldt, Darwin, F. Unger, Von Heer, De Jonnes, Targioni-Tozzetti, Hooker, Figuer, Thomas Nuttal, Mrs. Somerville, Flint, etc., and I believe that no candid and unprejudiced student can arrive at any other opinion at the present day.

III. ORIGINAL VARIETIES.

The varieties of maize are numberless, and we know of no adequate attempt to reduce them to a system whereby they may be intelligently classified and described. So uncertain are the majority of the descriptions in general use, that it seems impossible to identify varieties except by actual comparison with a typal specimen from the hands of the originator, or the first to apply the name It is but through access to large collections, and by a careful study of the grain and its plants from every point of view, that success can be expected for any attempt to familiarize the differences which occur. It would be easy to prepare a long list of names and to classify according to statements made, for this would but require access to files of seed catalogues, and a close poring over the columns of our agricutural press, but then when we had obtained this material, *cui bono?* We shall hence content ourselves with reference to such few varieties of which we have an ascertained history, and which are asserted to have been derived from the Indians.

There are said to be 130 varieties in Spain. Bonafous mentions ten varieties of white, twelve of yellow, one of red, and one was variegated purple on a yellow ground. Heller describes shortly

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six varieties as among the best known in Mexico. Salisbury defines forty-four varieties, grouped after a certain form of arrangement. Bement six varieties of yellow and eleven of white. Klippart furnishes a description of seventy-one varieties, and Burr of thirty-four.

King Philip Corn.— So called after the celebrated Indian chief of the Wampanoags of that name, from which tribe the seed was obtained. It has been cultivated from times anterior to the landing of the Pilgrims. It is a hardy plant, with small stalks, and grows to about nine feet in height. The ears are eight-rowed and from ten to fourteen inches long.(56) The improved King Philip or brown corn has the kernel coppered, rather large, somewhat broader than deep, smooth and glossy; cob small and pinkish white.(57)

Mandan Corn.— Grown by the Mandan Indians on the Missouri river, as high up as its source. It is *Zea Mays, L. Var. Præcox, Nutt.* Culm or stalk very short, spathes or husks arising from the base of the culm; seed mostly in eight rows.

Pueblo Corn.— This is supposed by Dale to be the original corn of America, and is cultivated by the Pueblo Indians of New Mexico and Arizona. The grains vary in color through shades of pink, blue and white, and the ears are generally rather small and slender. The blue variety is preferred for bread, and is sorted from the rest with much care and stored by itself. The ear has fourteen rows of grain, which are full and plump, and is six and three-quarter inches long, and four and three-quarter inches round.(58) This variety is stated to bear a strong resemblance to that which is most common in the New England States; the average height of the stalk is not more than six feet, and the ear is generally within one foot of the ground. The cob is large, writes Mr. Massie,(59) but by way of compensation is unusually long. The grain is roundish, instead of long and flat, and the grain or head is in larger relative proportion to the rest of the grain than is generally the case with the varieties produced in the States. The colors are blue, yellow, white, red, and even jet black.

Sioux Corn.— Also called Golden Sioux and Northern Flint corn, derived from the Sioux Indians in Canada. The cob is large, rather short, and bears twelve rows of moderate-sized grains.(60)

Squaw Corn.— Formerly cultivated by the Indians of Michigan. Ears eight-rowed, cylindrical, from four to eight inches long, and from

(56) Bement. Trans. N. Y. Ag. Soc., 1853, 333.

(57) Burr's Garden Vegetables, p. 173.

(58) U. S. Dept. Ag. Rept., 1870, 420.

(59) U. S. Pat. Of. Rept., 1852-3, 346.

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one and a quarter to one and a half inches in diameter. Cob less firm than in some other varieties.

Sweet Corn.—This variety was introduced into Massachusetts in 1779, by Capt. Richard Bagnall, of Plymouth, from the country bordering on the Susquehanna, on his return from the expedition under the command of Gen. Sullivan against the tribes of the Six Nations. There are now varieties with a red cob and a white cob. The ears are short and usually contain eight rows, the grains of which when mature are usually of a light color, and become shriveled when ripe.(60) It is probably that this importation is not the original of all the varieties we at present possess, although it perhaps enters into the parentage of the majority of them.

Tuscarora Corn.—This corn is thought to be the variety which was found in cultivation upon the settlement of North Carolina. When the Tuscarora Indians were removed to a reservation in Niagara county, N. Y., in 1712, they brought this seed-corn with them. It has long been cultivated by the Onondagas. It forms a large and tall plant. The ears contain from eight to twelve rows of grain, according to Salisbury, or from twelve to sixteen, according to Bement. The kernels are entirely destitute of a corneous covering, are said to be white or yellow in varieties, are sometimes slightly dented, as broad as long, and of very light weight for corn. The cob is from seven to ten inches long, and of a light red color.(61)

Wild Corn.—Also called Oregon corn, California corn, etc., variously described. Klippart(62) says the cob does not exceed half an inch in diameter; is very pithy; the grains are each enveloped in a separate husk, and attached to the cob. The grain is very flinty, dented, rather ovate, sides convex, and pointed at its place of insertion on the cob.

Salisbury (63) says the wild corn, Rocky Mountain corn, Texan corn, forage corn, *var. Tunicata*, of which there are several sub-varieties, such as the white, the yellow, the red and the purple. In all of these, each kind is inclosed in a husk, which by cultivation becomes shorter and shorter till it is scarcely perceptible. The kernel is generally small, deeper than wide, dented. Ears from six to twelve inches long. Plant under favorable circumstances large and stout, often from eight

(60) Trans. N. Y. Ag. Soc., 1848, 836; 1853, 336, etc. The origin as stated may be questioned.

(61) T. P. Devereux, U. S. Pat. Of. Rept., 1849, 142. H. Powers, ib., 1853, 115. Salisbury, Trans. N. Y. Ag. Soc., 1848, 835.

(62) Agr. of O., 1858, 524. Figures given.

(63) Trans. N. Y. Ag. Soc., 1848, 837.

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to ten feet tall. Mr. E. S. Carman writes:(65) "Wild California or Oregon corn, Rocky Mountain corn, Texas wild corn, cow corn — each kernal is inclosed in a distinct covering, the whole ear also being enveloped in a husk. These secondary husks, which inclose the kernels, are an inch or two in length at the base of the ear. The kernels in many of these are abortive, but higher up the husks or tunics gradually decrease in length, and as this takes place the kernels become fully developed until near the summit, the coverings scarcely inclosing them; in fact, the terminal grains in some specimens protrude more or less. The grains are white, somewhat hard and flinty." Mr. Carman has known this variety to have been cultivated in the Western States for the past thirty years, without yet showing any great variation when planted at some distance from the naked-kernel sort. According to Professor Gray, the seeds of the Brazilian variety produce either common or husked maize.(66) This variety is figured in Bonafous' work, plate v, and by Lindley, as grain from North America, and in the Journal of the Horticultural Society, vol. 1, 1846, p. 115.(67)

Wyandotte Corn. — First introduced 1853 by J. R. Thomas, of Waverly, Ill., who procured the seed from the Wyandotte Indians. It is pearl white, the meal white as flour, large grains shaped like the yellow flint, soft, twelve rowed, small cob twelve to fifteen inches long.(68) Klippart(69) says this curiosity is unworthy of culture, on account of its lightness and lateness. It has many suckers, and all produce tassels and ears, and a single grain is sufficient for a hill. Each stalk may bear from four to eight ears, and each ear from eight to ten rows.

Although botanists are now agreed that there is but one species of corn, yet some of the earlier writers separated *Zea Mays*, L., into a number. Steudel, in his Synopsis Plantarum, furnishes seven: *Zea Mays*, L. *Zea hirta*, Bon., the hairy maize, having its leaves and husks hairy, and its spikelets sessile or seated close on the male flower, its leaves nearly parallel with the culm, pendulous; from California. *Zea rostrata*, Bon., spike elongated; seeds at the apex recurved,

(65) Moore's Rural New Yorker, March 8, 1877. Figures given. The variety probably the same as figured in U. S. Pat. Of. Rept., 1858, 98. A colored kernel is figured in the frontispiece of this latter reference.

(66) Darwin. An. and Pl., under Domes, i, 886.

(67) See, also, De Candolle, Geograph. Botanique, p. 951, and Teschemacher, in Proc. Boston Soc. of Nat. Hist., Oct. 19, 1842.

(68) Agr. of Mass., 1858, 75.

(69) Agr. of O., 1858, 517.

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mucronate; in Peru. *Zea macrocarpa*, Klotzsch, seeds compressed plane; albumen all farinaceous; in Peru. *Zea curagua*, Molini; culm low; leaves serrate; in Chili; sometimes called stone maize. *Zea cryptosperma*, Bon.; this is the covered maize, or wild corn; in Buenos Ayres. *Zea erythrolepsis*, Bon., or red-husked corn, with grains compressed, plumes red.

With but trifling exceptions, any specific distinction here afforded, may be found in a field of one variety of cultivated corn, as few plants are subject to wider variation of habit.

IV. VARIATIONS.

We shall here give an incomplete list of variations, using for illustration, as far as may be, the varieties which have been described by authors, in preference to those in our own collection or our own observation:

1. Colors.

Amber-colored.....	Early sweet varieties.
Semi-transparent, white.....	Sweet varieties.
Semi-transparent, yellowish.	Sweet varieties.
Flesh colored.....	Eight and twelve-rowed flesh. *Salisbury.*
White.....	White-flint, White gourd seeds, etc.
Dead-white.....	Tuscarora.
Yellowish white.....	R. I. Asylum, early dwarf sugar. *Burr.*
Tawny.....	Smutty-white, of Cape Cod.
Yellow.....	Canada yellow, yellow dust, etc.
Orange.....	New England eight-rowed, in varieties.
Red.....	Red pop, New Eng., 8-rowed red, Hematite. *Salis-*
Dull red.....	Master. *Klippart.* [*bury.*
Red tinged.....	Red blaze. *Salisbury.*
Copper red.....	King Philip.
Purple.....	Purple Wyandotte. *Klippart.* Red-kerneled rice.
Blue.....	Pinto. *Heller.* Omaha. *Klippart*, etc. [*Burr.*
Dark brown.....	Illinois brown. *Klippart.*
Black.....	Mexican. *Flint.*
Slate black.....	Mexican sweet. *Burr.*
Variegated.....	Calico. *Salisbury*, and hybrids without number.

2. Number of Rows of Grain in each Cob.

8-rowed.....	Golden sweet. *Burr.* Canada yellow. *Burr.*
8 to 10-rowed.....	Narragansett. *Burr.* Baden. *Klippart.*
8 to 12-rowed.....	Mexican flint. *Klippart.*
10-rowed.....	White pop. *Klippart.* Chinese tree. *Bement.*
10 to 12-rowed....	Dalton. *Burr.* Yellow flint. *Burr.*
10 to 14-rowed....	Early Adams. *Klippart.* Peabody's prolific. *Klippart.*
10 to 16-rowed....	Wigwam. *Klippart.*
12-rowed.....	Golden Sioux. *Bement.* White flint. *Bement.*
12 to 14-rowed....	Red cob sweet. *Burr.* Bayou. *Klippart.*

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12 to 16 rowed....	Illinois yellow. *Burr.* Bonum. *Klippart.*
12 to 18-rowed....	Stowell's evergreen. *Klippart.*
14-rowed.....	Trumbo. *Klippart.*
14 to 24-rowed....	Wabash. *Klippart.*
16-rowed.....	White cap. *Klippart.*
16 to 22-rowed....	White Horse-tooth. *Burr.*
16 to 24-rowed....	White gourd-seed. *Klippart.*
16 to 20-rowed....	Tree corn. *Klippart.*
18-rowed.....	Gourd-seed. *Klippart.* Yankee. *Klippart.*
18 to 32-rowed....	White gourd-seed. *Burr.*
20-rowed.....	Large white Tennessee. *Klippart.* Pennsylvania. *Klippart.*
24 to 26-rowed....	Large yellow gourd-seed. *Salisbury.*
24 to 36-rowed....	Virginia white gourd-seed. *Bement.*

We also find statements of forty and forty-eight rows of grain for single ears.(70)

3. MAXIMA AND MINIMA.

The largest cob we have seen was one exhibited at the Centennial Exhibition at Philadelphia, which was when dry, fourteen and a-half inches; this was an eight-rowed variety.* We find record for maxima: ears twelve to thirteen inches in circumference and from twelve to fourteen inches long; another ear twelve inches long, nearly ten inches in circumference and bearing 1,446 kernels, three-quarters of an inch in length; another ear mentioned as containing 1,006 kernels and being sixteen inches in length.

The smallest ears we have seen have been one inch long. Mr. J. B. Walker, Concord, N. H., has a variety of pop-corn from Vermont, which bears, as a crop, ears only from one and a-half to two inches long.

As to the size of the kernels, we have noted in one small collection a range in weight as six to one, as between the Benton corn, from Connecticut, and an ordinary golden pop-corn; Darwin, in a small collection, found a difference by weight between kernels of two varieries as seven to one.

4. VARIATION IN COLOR OF COB AND GRAIN.(71)

White cob and white kernels.....	White flint.
Flesh-colored kernels.....	Eight-rowed flesh.
Red tinged kernels.....	Red blazé.
Red kernels.....	Eight-rowed New England red.
Blue kernels.....	Blue pop.
Black kernels.....	Mexican sweet.
Yellow kernels.....	Canada yellow.

(70) U. S. Pat. Office Rept., 1847, p. 181.

* We have, since writing this, seen an ear of Benton eight-rowed dent corn, sixteen inches long, when thoroughly dried. As to size of kernels, we have noted in varieties, not selected kernels, as sixteen to one in weight.

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Variegated kernels	Calico.
Red cob and white kernels	White Virginia gourd seed.
Yellow kernels	Ohio Dent.
Red kernels	Red pop.
Red and white cob and white kernels	Early white. *Klippart.*
White and red cob and white kernels	Hackberry white. *Klippart.*
Pinkish white cob and white kernels	Tuscarora. *Burr.*

5. Variations in Maturity.

Parmentier mentions a corn in Hungary which ripens in sixty days, but we are rather distrustful of our quotation; a variety in the Ionian Isles called cinquantino, is said to ripen in fifty days (71)

Salisbury gives ninety days for the small yellow pop corn, and 135 to 150 days for the Pennsylvania dent. Flint says the Canada corn ripens in 100 days from planting; the Rocky Mountain corn in 140 days; the range in the United States seems from 100 to 200 days.(72) Darwin from his authorities, states as the limits, three or four months for the dwarf kinds, and six or seven months for the taller varieties.

6. Variations in Growth.

Flint mentions corn in Tennessee, when the plant averaged in fields sixteen to eighteen feet high, and exceptional stalks measured twenty-two feet three inches long.(73) John J. Thomas states that this plant has been known to attain the height of thirty feet in the West Indies.(74) Morelet says of Central America:(74) "Our eyes wandered over undulating expanses covered with maize, the stalks of which here often reach the height of from seven to eight yards. We carefully noted the stalks of corn exhibited at the Centennial, and although we did not actually measure any specimen, yet we are quite confident that some exceeded fifteen or sixteen feet in height; the tallest we have actually measured has been fourteen feet ten inches. Bonafous (75) describes a dwarf variety sixteen to eighteen inches tall. We have never seen a variety growing in fertile soil which was under four feet, yet individual hills, on sterile land, may show a much smaller growth. In the twenty varieties grown side by side by Salisbury, all planted on the same date, one variety, the small eight-rowed Canada, began

(71) Except as noted, the authority is Salisbury.
(72) *U. S. Pat. Of. Rept.*, 1859, p. 121.
(73) U. S. Pat. Of. Rept. 1848, pp. 652–655.
(74) Agr. of Mass., 1858, p. 71.
(74) Trans. N. Y. Agr. Soc., 1843, p. 181.
(74) *Trav., p.* 226.
(75) Nat. Hist. du Mais. See Scientific Farmer, Aug. 1878, p. 117.

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to flower July tenth, while the latest flowering variety was the Rocky Mountain corn, August tenth, a variation of one month; the tallest plant was the large white flint, ten feet six inches; the shortest growth, the squaw corn, five feet ten inches.(76) The height which a corn plant may assume depends largely upon the closeness of planting and the fertility of the soil; a nitrogenous manure and close planting tending to elongate the nodes, and thus to lengthen the plant over what it might otherwise have measured. In some varieties we have naturally a more elongated node than in others; and hence we have a different appearance to the leafing. Some varieties, like the Wyandotte, are disposed to sucker greatly; other varieties show but a feeble tendency to increase their stalks in this manner. Some varieties bear their ears high up, others low down on the stalk. Some varieties normally show a tendency to bear several ears to a stalk, others but one ear, and still others are so feebly prolific that many stalks show no ear whatsoever. We have counted nine ears to a stalk, have found record (77) of a stalk having been exhibited at an agricultural fair, which had twelve ears, and have been told of fourteen to a stalk. Some varieties bear a terminal ear on a branch, other varieties bear the ear axillary, and exceptionally a branch may occur with several axillary as well as a terminal ear. Some varieties bear their ears on determinate nodes, so much so that this habit seems strongly characteristic.

7. VARIATIONS FROM CLIMATE.

It is a common observation among farmers that corn changes its character when removed from one locality to another. Thus Canada corn removed to New Hampshire or Massachusetts shows a marked tendency towards lengthening of the ears, often towards a change from a strictly eight-rowed variety to one containing many ten and twelve-rowed ears, and a stronger and taller growth of plant. Southern corn moved north is said to grow smaller. Flint corn, removed from the hill fields to intervales, to assume a dent character, or even, in cases, to be entirely changed, and *vice versa* for the gourd-seed varieties, which tend contrariwise, towards the flinty habit. No corn, unless restrained within its type through the exercise of the art of selection, can maintain its original character when removed to regions where it meets with a different set of adaptations to be overcome. The corn-plant is, however, so subject to change through

(76) Trans. N. Y. Agr. Soc. 1848, pp. 766–769.
(77) U. S. Pat. Off. Rep. 1747, p. 131

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cross-pollenation, that it is difficult to study the influence of climate on its growth, for oftentimes we must believe that the change of a variety into another, analogous to that cultivated about it, is often due to unnoticed pollenation by the variety predominant in the vicinity.(78)

8. Hybridizing.

By this term we mean the cross-fertilization, or the influence of pollen from one variety acting upon the ovule of another, and not the crossing of distinct species, as would be inferred from the accurate meaning of the word "hybridize"—*i. e.*, the crossing of *species*. As the influence of pollenation as changing the character of the fertilized ovule is not clearly recognized by scientific writers, we shall devote a little space to this branch of our subject.

Thus Gaertner (79) affirms that the pea seems an exceptional plant, as being influenced in its color by the pollen from another variety, and distinctly states that the white dwarf variety of corn, when inoculated with the large red-striped form, produces seeds which exhibit no change of color, though when sown they give rise to variegated spikes. Darwin (80) says distinctly that the pollen of one species or variety, when applied to a distinct form, occasionally causes the coats of the seeds and the ovarium or fruit, including even, in an instance, the calx and upper part of the peduncle, of the mother plant, to become modified. Sometimes the whole of the ovarium or all the seeds are thus affected; sometimes only a certain number of the seeds, as in the pea, or only a part of the ovarium, as with the striped orange, mottled grapes, and maize are thus affected. He again writes (81) that when peas of one color are artificially fertilized by pollen from a variety of another color, peas of the two colors may appear in the produced pod. This has been proved by Gaertner and Berkeley, so far as the influence of pollenation on the *skin of the pea*, etc. Gallesio fertilized the flowers of an orange with pollen from the lemon, and we find those produced bore a longitudinal stripe of peel having the color, flavor and other characters of the lemon.

We might offer other instances which we have met with, but as Darwin, with a far superior knowledge of the credibility of authorities, has quite fully treated this subject, we may conclude that the present

(78) For references see U. S. Pat. Off. Reports, 1849–50, 124, 142, 169, 175, 182, 224, 226; ib., 1850–51, 371; ib., 1848, 135; ib., 1847, 391; U. S. Dept. Agr. Rept., 1862, 229, etc.

(79) Journal Horticultural Society, London, 1850, 165.

(80) An. and Pl. under Domes, I, 432. (81) Ib., I, 429.

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state of science credits the influence of the pollenation in modifying the seed to be limited to the skin or outer coating alone. As this is not in accordance with the facts as we have observed them, we proceed to give the result of our own observation.

The silk, succulent and translucent, emerges from the sheath, and evidently remains in this condition for a considerable period, even two or three days, or even longer, if pollenation is not affected; so soon, however, as the pollen gains access, it turns brownish and dies at the extremities; and, under favorable conditions, this change need not occupy more than a day. By removing the silks under the microscope, and brushing them with the pollen, these minute grains were observed to adhere, and after a time to change their shape and become wrinkled, yet but slightly, and to send out a tubular prolongation. When numerous grains were lodged on the silk under examination, in a few hours the texture of the silk became changed, showing less transparent and certain other differences difficult to be expressed. This is in harmony with the description of the action of pollenation as given by Thome, but I was unable to detect the whole process. He says:(82) "When pollenation has been fully accomplished, the pollen grain, excited by the viscid fluid exuded by the stigma, puts out one or more long tubes, the pollen tubes, which are unicellular and usually simple. These penetrate through the conducting tissue of the style, and reach the interior of the cavity of the ovary in a few hours; in the case of *Colchicum* in about twelve. Then they come into contact with the ovules and attach themselves closely to them," etc. When we consider the size of the pollen grain of corn (about one-three-hundredth of an inch in diameter) and the length of the silks (occasionally eighteen inches or more for the butt grains), we must believe that the pollen tube elongates by the absorption of nutriment from the cells of the silk. We have proven that the stigmatic surfaces of the silk extend quite a distance from their extremity, for several ears of sweet corn were opened by us, the extremities of the silks all removed with a knife, and yet the silks elongated and received the pollen, and the kernels *all* developed with the exception of a few at and about the top of the cob.

Now, when a kernel fails to become fertilized, there is an influence exerted on the cob, for when the central portion of the cob fails to become fertilized as to its grain, the cob shrivels at this point very greatly, and becomes hard and woody, while the cob under the fertil-

(82) Text-book of Struct. and Phys. Bot. By Otto W. Thome. Translated by A. W. Bennett. New York, 1878, p. 187.

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ized portions is pithy and cellular and succulent; indeed, in these cases we find the cob at either extremity of the ear normally developed, but the intervening portion of small diameter, and of an obviously different nature. We here have the effect of cross-breeding exercised on that portion of the plant which bears the grain! Indeed, the same fact is illustrated in those more frequent cases when some few only of the ovules of the cob receive pollen. What a difference at harvest between the flexible, flimsy, unfertilized cob, and the rotund, hard and tough cob which is studded so abundantly with grain. This action of the pollen probably affects the habit of growth of the whole plant, for the trained eye can determine at a distance with considerable certainty, as we have many times proven to doubters, the ear-bearing and the non-ear-bearing stalks, which occur in fields which we have studied.

Professor Beal states(*) that the different kinds on the same ear may have twenty or more different parents. He shows some ears where sweet corn and pop corn had been planted near each other, where the color, size and texture of some of the kernels had been changed. We have seen an hybrid corn made up of five distinct varieties; we have observed yellow corn, white corn, flint corn, red corn, and sweet corn kernels occupying the same ear, sometimes two varieties only, sometimes three, sometimes all, and we see no reason why if twenty distinct varieties of a similar flowering period were planted together, we should not recognize all the twenty on some ears of the crop of the same year.

We have noted, as an effect of cross-pollenation, a change of color, a change of shape, and a change of quality. Not only is the change not confined to the skin, the episperm or testa, but extends to the albumen or endosperm, and even to the chit, the embryo, or germ. If the grain of a pop corn, a flint corn, a dent corn, and a Tuscarora corn, be split, there will be seen three arrangements (two in the Tuscarora) composing the chit, the white, starchy portion, and the corneous portion, each well defined and bearing different relations to each other. If the cross-bred corn of these varieties all grown on the same cob, but with their peculiar male parent, be examined, they will be sure to present these same differences, each according to their outward change. The pop corn will show its visible oil or corneous portion, extending even to the chit, and will pop; while its neighbor, a flint corn, will show a broad, white, starchy portion between the chit and the corneous portion, and will not pop, etc. Indeed, the chits even will show each a difference,

(*) Mich. Board of Agr. Rept. 1876, 212.

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a dozen kernels of corn. They then carefully
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th was laboriously scraped up around the stalks with
each hill was about two feet high.(84) The Sieur de
1605, touched at the mouth of the Kennebec river.
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our grains in a place, covering them with earth; at a dis-
three feet plant as much more, and so on. They plant their
May and gather it in September." At the Saco river: "The
gros told us that all who inhabited this region cultivated and
ved the land like those we had seen." At Cape Cod, July 21st:
"We landed, and passed through a field of corn, planted like those
we had seen before. The corn was in blossom, and about five and a
half feet high. * * * There were also several fields not cultivated,
being left to recruit in fallow," etc.

(84) Champlain's Voyage. Prince Soc. Ed., 121, 64. Wood's New Eng. Pros pects; 1st ed., 81, etc. This description applies also to Virginia, see Capt. John. Smith's account of the Indians of Virginia.

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and will appear allied to the variety whose form they have assumed. If the corn grains are split and treated with chemical solutions, sulphate of copper will produce a green coloring to the chit, and iodine a violet coloring to the starch, while the corneous portion will retain its proper color. We hence have defined, not the absolute presence or absence of oil, etc., from the colored portions, etc., but a strictly defined division of physical arrangement, which differs in relative size with the varieties and in the manner of its arrangement.

In the forming of varieties, this cross-fertilization bears a large part. Thus the difficulty of maintaining more than one variety on the farm, unless the blooming period be different. We quote from Burr, that the golden sugar corn is the result of a cross between the Canada, a flint corn, and Darling's Early, a sweet corn; that the Old Colony Sweet was formed from the Southern White and the common sweet corn of New England, but when these hybrid varieties are formed, it requires a long series of selections to fix the new type, and to prevent its occasionally reverting to one or the other of its ancestors.

These eight headings, under variations, are but shortly treated, and are designed to illustrate the difficulty which must attend a botanical history of corn, as well as to give impress to a few facts of general concern. They have a connection with our subject as formulating some of the facts which must be used in the effort to trace corn to its origin through its variations; a task by no means hopeless, yet one which shall require the deepest study and the most pains-taking investigation. It had been our intention to have attempted the tracing of climatic variation and its correlative effect upon the distribution of this cereal, but we find the data we have collected as yet insufficient. We will but say that variation can be brought about and fixed, by means of which the culture of corn can be constantly extended beyond its present limits, as is shown by its wide range of adaptations, and its pliability in the hands of man; and that this same variation can be used to greatly extend its cropping capacity through inheritance guided by the intelligent mind.

V. INDIAN CULTIVATION.

Among the aborigines, as in many, if not all the uncivilized tribes of the world, the care of the fields was consigned to the females of the tribe, and Schoolcraft mentions that among our Indians the corn-planting and the corn-gathering was done by the women and children, aided by a few of the superannuated old men. This was not considered a hardship, but rather, in their view, an equivalent for the

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onerous and continuous labor of the men in the chase and in war. They held many superstitions concerning the corn crop, and merriments connected with the joyful season of harvest, which even now are not unknown in rural neighborhoods. "If one of the young female huskers finds a red ear of corn, it is typical of a brave admirer, and is regarded as a fitting present to some young warrior." Compare this with the practice even now in vogue in our farming districts, where the finder of a red ear is entitled to give or receive a kiss. Curiously enough, the present mode of culture differs but slightly from that culture taught by the Indians to the colonists at Jamestown in 1607.

The Indian method was laborious, as would be expected when tools, save those rude ones made from the sliver of wood, or of a clam shell, or a flat stone, were unknown. A space was first cleared, in New England and along the coast, by burning the dead wood; the debris was then collected into piles, which were again treated with fire; and thus, through perseverance and toil, a free space was gained from the forest. The Indians of the coast understood the value of manure, for they would bring sticks to the cleared land to be burned, and oftener added a fish from the sea, a sucker from the stream, or a horse-shoe crab from the beach, to each hill. These coast Indians then dig holes about four feet apart, using a rude hoe formed from a clam shell, or of the flat shoulder-blade of the moose, or of a crooked piece of wood. Into these holes the fish were dropped and covered, and then about half a dozen kernels of corn. They then carefully protected the field from the ravages of birds and vermin, and as the corn grew the earth was laboriously scraped up around the stalks with clam shells until each hill was about two feet high.(84) The Sieur de Champlain, in 1605, touched at the mouth of the Kennebec river. In his journal, he says: "Here we saw Indian corn, which they sow three or four grains in a place, covering them with earth; at a distance of three feet plant as much more, and so on. They plant their corn in May and gather it in September." At the Saco river: "The savages told us that all who inhabited this region cultivated and sowed the land like those we had seen." At Cape Cod, July 21st: "We landed, and passed through a field of corn, planted like those we had seen before. The corn was in blossom, and about five and a half feet high. * * * There were also several fields not cultivated, being left to recruit in fallow," etc.

(84) Champlain's Voyage. Prince Soc. Ed., 121, 64. Wood's New Eng. Prospects; 1st ed., 81, etc. This description applies also to Virginia, see Capt. John. Smith's account of the Indians of Virginia.

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In New York State, an old Oneida Indian stated to Mr. Schoolcraft, that "in ancient times the corn hills were made so large that three clusters of stalks were raised on each hill, and that the hill once prepared was used year after year, causing them to be kept large, and accounting for their distinct continuance to this day."

In Minnesota, in 1819–20, the Sioux Indians planted the corn in hills raised from eight to twelve inches high, the top leveled to the size of six or eight inches in diameter, and made by means of a hoe purchased of the traders, or the branch of a tree sharpened.(85)

In the dry regions of the southwest, where it would seem that a crop could only be grown by irrigation, the Navajos have a peculiar custom, whereby moisture is conserved for the young plant until it passes through the germinating period. The roots are placed far below the dry surface, and in the region of moisture, by forming holes twelve or eighteen inches deep by means of sharpened stakes which are driven into the ground to form the planting places. One or more kernels of corn, previously enveloped in a ball of mud about the size of the fist, are dropped into these holes, and covered with light earth to the depth of two or three inches. As the moisture of the mud brings about germination, the roots extend immediately into the moistened lower strata of the soil, and thus this method seems to provide a crop when corn planted in the ordinary way, near the surface, would perish.

VI. PRODUCTS.

The Indians and natives of the countries where it occurred eat it green and roasted or boiled; also the dry grain boiled (the prototype of our hulled corn), parched or bruised into a flour of which various kinds of bread were made. They also made an intoxicating drink from the grain, and extracted the oil, which served them as a butter. Mr. Winthrop says the Indians made samp from it. The Peruvians made vinegar. At the present time the grain enters largely into consumption as food for animals, either ground or whole. It is also extensively used in the form of meal in our families, and occurs also prepared in numerous ways. Thus: whole, as hulled corn; cracked and broken, as varieties of preparations known as samp, hominy, etc.; ground and specially treated, as maizena, farina, cornstarch, etc., which are served in the form of puddings on our tables; and but few of us but are familiar with its preparations under the name of hasty pudding, johnny-cake, hoe-cake, mush, corn-cakes, corn-bread, Indian pudding, hominy, succotash, etc. The grain is also used

(85) P. Prescott, U. S. Pat. Of. Rept., 1849–50, 451.

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largely for the manufacture of whisky. Glucose has also been made from it by treating corn-starch with sulphuric acid. The green corn is a favorite vegetable, as we all know, and the business of canning for winter use employs a large capital.

The stalks furnished a kind of honey to the Peruvians, from its juice, and to the Mexicans a kind of sugar. During the Revolutionary War it was quite common for our farmers to procure from this source their family stock of molasses. In the New York Agricultural Society's Transactions for 1843, will be found an account of sugar-making on quite a large experimental scale. The stalks also furnish an excellent fodder for cattle when well cured, being worth for feeding purposes from one-half to three-fifths the value of good hay. Fodder corn, or the stalks cut green, is a well-known and appreciated cattle food, largely grown to supplement the pasturage during the month of drought.

The husks are used in the domestic manufacture of mats, being first soaked and then twisted and braided. The inner husks will make a beautiful writing paper, and a grayish paper can be made from all parts of the plant. Cobbett published a book on corn printed on paper made from the plant. The husks also find use as a stuffing for mattresses. Experimentally, they have been successfully used for making a textile fabric, a sort of crash.(86)

Finally, the pith may be used for cleaning metal, as the threads of fine screws; the cob furnishes a good kindling; an excellent dye has been extracted from the grain.

VII. POSTSCRIPT.

Classification of Varieties.

As a prelude to a careful investigation into the history of the distribution, habits and variations of the corn plant, it seems desirable to devise a scheme for the classification of varieties. No satisfactory one has yet, so far as we are aware, been proposed, and it is probable that our knowledge of the corn plant is not as yet sufficient to admit of a natural classification. Bonafous attempted to do it by color, but this is entirely unsatisfactory. Flint makes no real attempt. Salisbury succeeds to a certain extent, but his scheme is quite faulty as based on the characters of the seed alone, not on the ear, and upon characters which are exceedingly changeable. His grouping is as below:

1. Those the kernels of which have a corneous portion, and are rather shriveled or indented.

(86) U. S. Dept. Ag. Rept., 1863, 436.

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2. Those the kernels of which are destitute of a corneous portion, and are rather shriveled or indented.

3. Those the kernels of which have a corneous development on their sides, and a dent or depression on their crowns.

4. Those the kernels of which are destitute of a corneous portion and shrink or contract at maturity, giving a shriveled appearance to the epidermis.

5. Those the kernels of which are destitute of a farinaceous portion and at maturity shrink or contract, giving a shriveled appearance to the epidermis.

6. Those with each kernel inclosed in a husk or sheath-like envelope, aside from the general covering of the ear.

Under these divisions he forms classes based on the color of the kernels and the cob, and within these classes are placed the varieties or kinds which have the ear and grain specifically described.

Klippart attempts a division into hard and soft corn, but does not make a success of it. Flagg forms five divisions, according to uses, the most artificial arrangement possible. Thus:

1. Feeding corn, comprising the dent and gourd-seed corn, preferable for its softness.

2. Meal or flour corn, comprising the hard or flint corn, which is too hard for profitable feeding, but keeps better when ground.

3. Roasting ear corn, embracing the sweet and sugar corn.

4. Pop corn.

5. Fancy varieties, such as those cultivated for ornament or curiosity, that have no particular value for any useful purpose, such as the Japanese maize.

POSTSCRIPT II.

Since the above was in type, we find other information which adds somewhat to our history of corn:

NEW HAVEN, *April* 18, 1879.

MY DEAR DR. STURTEVANT:

You ask for notes relating to the *History* of the corn plant. I have among my books old Kybers' Botany, 1552 [Hieronymi Tragi, de stirpium Maximæ Earum quæ in Germania nostra nascentur * * * intrepreto Davide Kybers Argentinese]. (Hieronymus Bock [or Tragus as he wrote it], one of the earliest writers on German plants, born 1498, was a teacher, director of the Royal Gardens, etc., died 1554. He published in German, 1539, without illustrations; then in 1551 a new edition. This is Kybers' translation into Latin; the woodcuts in this translation were designed for the edition of 1551. So

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this brings back the date a little), in Latin, with figures and description of maize (the earliest figures I am familiar with), under the name of *Turkish Korn*, the name it still has in Germany. (Everything foreign or barbarous was *Turkish* in the Middle Ages.)

Also *Gerarde's Herbal* (in English), Ed. 1597, the many figures of corn *uncolored*. I have seen colored figures showing red, white, yellow, spotted, and blue grains even then.

Also, old *Hernandez* Natural History of Mexico (Nova Plantarum, Animalium et Mineralium Mexicanorum Historia a Francesco Hernandez, * * * Rome, 1651); was sent by Philip II to Mexico, where he remained 1591–1600. His first edition, published in Spanish, in Mexico, in 1615. There is not a complete copy of this to be found now in Europe.

He brought back seventeen volumes of drawings and manuscripts, twelve of which were burned in Spain; and this Latin edition is of what was left, brought out in Rome first in folio in 1628, then in 4to in 1651. It is probable, therefore, that the text describes the condition of maize, its cultivated variety as it was in Mexico before 1600; the 4to edition, Rome, 1651, with figures and long Latin description.

This is important on some accounts, because he was a great student and his work a great one. * * *

The following notes from Bretschneider may interest you:

Dr. E. Bretschneider, physician of the Russian Legation at Peking, published at Foochoo, in 1870, a pamphlet "On the Study and Value of Chinese Botanical Works, with notes on the History of Plants and Geographical Botany from Chinese Sources."

He had made a special study of this. He says (p. 7 of his pamphlet), "In the same manner it can be proved, from Chinese sources, that maize and tobacco are not indigenous in China."

On page 18 he goes into this more fully, with the Chinese characters involved, etc:

"I have already stated that the maize, a native of America, has been introduced into China. *Li-shi-chen* was the first Chinese author who mentioned it, at the close of the sixteenth century, under the name of [my notes in these [ ] braces.—W. H. B.] [Gives the Chinese characters] *Yü-shu-shu* (Jade Sorgho);" [then he gives references]. He states that it was introduced from Central Asia. "Now-a-days it is largely cultivated in China, and bears in each province a different name [more references]. The Persian name of maize is *Ghendum* i Mekka (wheat from Mecca), that seems to prove that maize, after being brought from Europe, spread over Asia from west to east.

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* * * At Peking, maize is called [gives the Chinese characters] *Yii-mi* (Jade Corn). * * * Maize is abundantly cultivated in the neighborhood of Peking, and the bread baked from maize forms one of the cheapest articles of food of the poor. [In a foot note he says that maize is so cheap in Peking that even beggars enjoy, from time to time, the luxury of eating maize-bread; the usual food of beggars in China being such as dogs eat, often collected in the streets where it had been thrown.] [He then says that he had inquired of old men in Peking, all of whom said that maize had been cultivated there as long as they knew anything about it.] 'Moreover, a learned Chinese assured me that the cultivation of maize near Peking dates from the end of the *Ming* Dynasty, 1380–1644.'"

In the author's "list of Chinese works," quoted in the foregoing notes, sixty-one are cited; of the works written before the third century B. C., there are eight.

To return to *Hernandez*. While I think it is abundantly proved that the plant was cultivated in America at the time of the discovery, I think it has abundantly proved that it was unknown in the Old World. (That is why I have quoted Bretschneider so fully, for those who ascribe an Oriental origin usually refer to the Chinese.) Hernandez, in his time, thought it American. He says even the barbarous tribes knew it. * * * * I write this in response to your note, page 56 of the *Scientific Farmer*.

Yours truly,

WM. H. BREWER.

P. S.— I used to think maize, like some other plants, might belong to *both* the Old and New World. Now I do not think so.

In 1869, I met a Mr. Roezl, a German, with some considerable botanical knowledge, who had spent sixteen years in Mexico, and had botanized there somewhat extensively. I asked him if he had ever seen *Zea Mays* WILD there. He had not, and doubted if it was found in Mexico; but what was interesting to me he found in the State of *Guerero* a *Zea* which he thinks specifically distinct, and he thinks undescribed; the ears very small, in two rows "truly distichous;" the ear (but not each grain separately) covered with a husk, the grain precisely like some varieties of maize, only smaller and harder. If this statement be true, and it was made very positively, it is the only wild *Zea* I know of, and the only wild plant that may be a possible progenitor of the cultivated maize.

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Other material for history can be found in nearly all the early voyager's relations. In De Soto's march of invasion, *maes* is continually mentioned as cultivated in quantity, and is said to resemble millet. In the unfortunate expedition of Narvaez, still earlier, Cabeça de Vaca, found it generally cultivated even into the arid regions of New Mexico (?), Texas, Mexico, etc. In Brazil, in 1647, Nieuhoff speaks of it as "Turkey Wheat," called maiz by the Indians, etc. In Jamaica, Lunan confounds it with Guinea corn. In 1665, white and red varieties were in "good plenty" about Batavia. In the Illinois Horticultural Society Transactions, 1876, it is asserted by a Mr. Spitz, that he had found, in working a stone quarry near La Prairie, Adams county, Ill., both stalks and ears of corn, of full size and perfect in appearance, in a petrified condition, and imbedded in a strata of sandstone four feet in thickness, and that it was just like our Indian corn, etc., but this find was probably a delusion, some crinoid being mistaken for corn. In Illinois, corn is mentioned by Marquette in 1673; Allonez in 1676; and Membre in 1679, as cultivated by the Indians. In 1553, Peter Cieca, in his "Chronicle," speaks of maize being cultivated about Quito, Peru.

Postscript.

November 1, 1883.

At the time of writing this essay, I had had no access to De Candolle's work on the Geographical Distribution of Plants.

Maize is unquestionably of American origin; it was carried from America and distributed quite generally in the first few years after the discovery. It reached Java in 1496, through the Portuguese; and Guinea in the sixteenth century, when it became so generally known as to give use to the name of *Milho de Guine* to Hans Stade, in Brazil, in 1550, and to Heriot, of Guinea wheat, in Virginia, in 1586. In 1593, Hawkins finds "*mayes*," which we call *Guynne wheat*, at the Canary Islands. Through the study of the vernacular name in Europe it is quite plausible to believe that maize entered Europe through Spain, as also quite generally through the Turkish possessions.

It was brought to Spain by Columbus (Benzoni). It is mentioned in Germany by Bock in 1539; by Ruellius, a native of France, in 1536; and is said, by Targioni-Tozzetti, not to have reached Italy till 1610, but the plant seems to have been known there before 1557 (Ramusio).

In Asia it reached Java in 1496 (Rumphius); and in 1521 maize was found by Magellan at the Island of Limasava. Malte-Brun says

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China received it in 1516, and in 1775 it is enumerated by Thunberg among the edible plants of Japan.

In Africa it was received in Guinea during the sixteenth century, transported by the Portuguese (Humboldt); and Barbot says the seed came by way of the Island of St. Thomas in the bight of Guinea. At the Cape de Verde Islands it was sown before 1537.

In 1595 Mendan sowed maize on the Marquesas Islands; and in 1777 Cook sowed corn on Lepooga Island, but its distribution seems not to have been general among the Polynesian Islands.

It is scarcely worth while, at present, to attempt to trace the introduction of corn into foreign countries, as much obscurity must always prevail in the dearth of accurate mention. It is far more important to study the climatic changes it may have undergone, and to search into its adaptations; but we have neither the material or the time to do this, and we must leave our essay, with all its imperfections, realizing that, if rewritten, more mature thought would produce a radically different treatment of this interesting subject.

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THE BEET SUGAR INDUSTRY IN AMERICA.

Paper read at the Annual Meeting, January 22, 1879,
BY ERNEST TH. GENNERT,
of Portland, Me.

The beet sugar industry has, since it assumed the proportion of an industry at all, developed to such an extent, wherever it has been introduced, that it is considered in most countries in Europe the most important industry; and as the consumption of sugar not only increases with the increase of population, but also with the progress of civilization, it cannot be surprising that it has assumed, in less than fifty years, such gigantic proportions.

In order to understand the difficulties which we find we have to meet in introducing this industry on the continent of North America, let us look at the exact nature of this important industry.

Sugar is an organic substance, containing carbon, hydrogen and oxygen, and as it has never been produced in any artificial way, not even in minute quantities, it cannot be denied it is a product of the soil; it is an agricultural product, and as such it has long ago been acknowledged. Sugar has to be produced in the field; the farmer has to make it; the manufacturer only extracts it from the sugar-containing plants which the farmer produces.

The principal plants which contain sugar in large proportion are the sugar cane and the sugar beet; all the rest together, such as the sugar maple, sugar palm, and others, form but a fraction of a per cent in the sugar supply of the world. In former years the sugar cane was looked upon as the only plant whence sugar could be extracted in large quantities, and wherever this has been the case it has invariably been allied with human or negro slavery, and wherever slavery ceased to exist the production of sugar also ceased. We have seen this on the different islands in the West Indies, later in Louisiana, and still later in Peru, where, in order to produce sugar on a large scale, the very worst of human slavery has been introduced, that of Chinese coolies. It is, therefore, but reasonable to expect that whenever slavery ceases to exist in Cuba, the production of sugar will cease also; and as Cuba so far has supplied a large proportion of the sugar produced from

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cane, some country will have to come forward to take its place. Beet sugar, on the other hand, has been an offspring of science, and has been ever closely allied to it. The production of beet sugar only assumed the proportion of national industry after science had become the hand-maid of agriculture. Wherever we find the beet sugar industry flourishing, we find it combined with scientific, with rational farming, from which it is inseparable; one cannot exist without the other; and as one cannot exist without the other, one cannot be introduced without the other. And this compels us to investigate the state of our agriculture, to understand what the beet sugar industry has to expect from it. As the whole beet sugar industry is decidedly of an agricultural nature, we have to treat it as such, and we will soon find the greatest and, in fact, the only difficulty to be overcome to the successful production of $100,000,000 worth of sugar in the United States. This difficulty, this obstacle, lies in our low state of farming, in farming land by the quantity instead of making less land, with less labor applied, very productive; it lies in the mistake we make in considering ourselves a prosperous agricultural nation, when we ship, year after year, the fertility of our land to Europe, until we find ourselves face to face with the Pacific ocean. It sounds very deceptive when our daily papers tell us we have shipped so many hundred million bushels of corn, wheat, and other grain to Europe, we ship so many million pounds of meat, butter and cheese to foreign countries, but it sounds quite different when we learn that the average crop of wheat per acre this year in Tennessee has been four bushels; in Ohio, which was once the garden of the United States, ten bushels, and that in the whole United States it has been for many years eleven bushels. It is undoubtedly gratifying to learn that we can make as good cheese as any nation in the world, Holland, Switzerland, and England, and even the celebrated Limberger, not excepted; but it is quite another thing when we learn that nearly one-half the year our cows stand dry, simply because dry hay and ice water will produce neither much milk nor cream.

How, then, is the state of farming in countries where the beet sugar industry flourishes? We can find in Europe no State, nor even a district, where beet sugar had not brought with it remunerative, well-paying farming in general. We find this in every country, but, perhaps, in none more so than in Belgium. To say nothing of all the other industries, the beet sugar is, in Belgium, in the most flourishing condition; though a rather mountainous country, of which the iron and coal industry give best evidence, she exports large quantities of

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sugar besides supplying her own needs. The State of New York, if cut up, could be turned into a half-dozen kingdoms of Belgium. We find here, with the beet sugar interest combined, the most prosperous farming in Europe. According to statistics, to every two acres of land under cultivation there is kept in Belgium one head of cattle or its equivalent in sheep or swine. A farmer who cultivates eighteen to twenty acres of land there, not only makes a good living, but he accumulates money. How many can say so here in America? Many American farmers may shake their heads and think farm products must underlie a different law in Europe from what they do in America. Farm products bring about the same price all the world over, adding freight to transport them from one point to another. If wheat is worth one dollar a bushel in America or Russia, it is worth no more in England, France or Germany, with the addition of twenty cents for freight and other charges. Statistics show that forty bushels has been the average of many years together in all the wheat-producing countries in Europe, and we may say safely $1.20 has been the average price. If, then, the European farmer finds it more profitable to raise sugar beets and sell them to the sugar factories at from $3.60 to four dollars per ton, when they do average a crop of wheat amounting to forty-eight dollars, how much more profitable must it be to the American farmer when all the gross income he has from an acre of wheat is eleven dollars, of which the smallest part, if any, is not profit. In most places in the United States the common saying is, "the more wheat a farmer tries to grow the poorer he will grow." It must be accepted as a principle that what one farmer does, under ordinary conditions, another one can do; and what ten farmers can do, twenty and a hundred more can do, under the same conditions, if they will only try. What, then, has been the result obtained by many farmers who have tried to raise sugar beets during the last year? In giving these figures I shall be very careful to give the full names and post-office addresses, so as to enable any farmer to apply to them for more particular information than I am able to give in this short address.

First of all, allow me to read to you a letter from a pioneer in sugar-beet culture. Originally a ship-owner and shipmaster, he became a convert to the beet sugar industry while going to France in his own ship, but since the decline of the American shipping interest he has taken to farming, and does it more thoroughly than many who have been professional farmers all their life-time. Allow me to read

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to you a letter from this gentleman, Mr. Alex. Johnston, of Wiscasset, on the subject:

"My plan of work is much behind, but within a fortnight I will try to take off my memoranda on beet raising. The experience of my neighbors shows widely different results — all the way from nothing to eleven, twenty-four and thirty to forty tons to the acre. This last, by Mr. Richard N. Bailey, I am getting the exact data of, and mean to investigate very thoroughly. He spares no labor nor manure, has excellent soil, and is very prompt in sowing, weeding, thinning and cultivating between the rows; feeds out his beets to his cattle, all of them — hogs and even hens — to each and all. He thinks he can't sell at four dollars a ton; might do so for five dollars, delivered at railroad station three miles distant from his farm. He growls over the transportation cost only, and considers the crop worth more for his cattle. They all do; I sold my own for thirty cents per bushel of sixty pounds.

"They say if all the sugar (twelve per cent) and water (eighty per cent) is extracted from the root, the eight per cent left can be of no great value, and so very much prefer the entire root, without costly truckage, for their stock. At the same time they all admit that there is more *reliable* cash value out of the beets at twenty tons to the acre than from potatoes, corn, grain, hay, or any other crop they can raise; and that if good friable soil is chosen, well worked, fined and manured, promptly thinned, and kept positively clean of weeds the very day they can be detected in the setting sunlight greening the ground, there is no trouble nor uncertainty about a good heavy crop every time, worth from $100 to $125 per acre. So *they* think, and so *know* I, after some years' drill in raising beets. I was all alone in this town in beet raising for some years, 'beating' everybody, of course. But I 'beat' it into them, and now they begin to 'beat' me; and I am heartily glad of it, and so are the cattle. Mr. Bailey says that water in the beet at a reasonable temperature is better than the cold water in the brook or spring in winter and the 'shivers' that go with it, and that they don't drink near as much when fed regularly with roots as they do on dry hay and other such 'fodder.'

"The crops of corn, hay, potatoes and all the cereals are subject to great loss through many contingencies. Heavy winds, pouring rains, blight, rust, mildew, rot, bug, worm and beetle league together sometimes, and down goes the whole in quantity, quality and value, faster than one can breathe, far below the cost of production.

"The humble beet, firmly planted in the ground, laughs at the wars

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of the elements, the bugs, beetles, weevils and the thousand other unnamed skipjacks, each requiring some separate sort of 'pothecary stuff to circumvent, and goes steadily on renewing its broken foliage and quietly gathering up its sweets for future reliable usefulness. It cannot be long ere farmers will realize these facts and plant one acre at least with a crop which, with ordinary brains and prompt labor, will always conduct to a satisfactory issue. It is a crop which utilizes thoroughly the handy fingers and perfect eye of children, who can do great things in a beet bed for a small reward. This is the place for all, old and young, on the farm, who can do no hard work on most crops, but can very ably take care of this. It is a crop that yields more absolute *money* to the household than any other I know of per acre; no outs but the seed — perhaps two dollars. Two dollars out in the spring, and one hundred back in the fall! Please show us the crop which yields so large a return for the land, manure and labor on so small cash outlay.

"There must be 50,000 farms in the State of Maine. Almost every one can raise the sugar beet. Suppose 20,000 of them raise each one acre of beets, say twenty tons. They would grow then 400,000 tons — yielding $2,000,000 to the farmers. This crop would make at least 40,000 tons of sugar, or 80,000,000 pounds, worth $6,400,000. They can do it beyond all possible doubt, and if they don't within the next five years, then are their owners blind beyond all possible redemption.

"There is no experiment about it, the raising of the beets and the making of the sugar are well-established facts.

"I hope to live long enough to see an end to imported sugars in Maine, and the hard-earned money of the Maine farmer stop at home where it belongs.

"I forgot to ask a question about amber cane and its product. Gregory (seedman) says, 'it yields per acre from 140 to 250 gallons of syrup,' and that the sugar produced is six pounds to the gallon of syrup, and five to six pounds of syrup left to each gallon after the sugar is extracted, and that the sugar granulates in the barrels when set away.

"This to me is a very wonderful yarn. His story begins with seventy cents per gallon for the syrup by the barrel, and ends with ninety cents per gallon; 254 gallons at ninety cents, $255.60 the ultimatum, or fifty-four cents for sugar and thirty-six cents for leavings per gallon. I would like to inquire what kind of sugar is made from amber cane? What value per acre of this cane product in its best yield, against beet sugar per acre in its average yield? Will this cane

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stand frost after it is harvested, or must it be worked at once? Will it ever make the finest white sugar anyhow? I see not a syllable about it, either to raise or how to be worked. Please, very briskly, answer the four questions, and I will be greatly obliged.

"Yours, etc.,

"ALEX. JOHNSTON."

Here is an extract from the Register of Rural News:

"Messrs. Smith & Powell, of Syracuse nursery, have given us the measurement of a crop of beets raised in 1876 on one acre of land. The variety is known as the yellow ovoid; the ground was thoroughly sub-soiled and well taken care of. The crop weighed 118,400 pounds, or about fifty-nine tons; or, at sixty pounds per bushel, would amount to 1,973⅓ bushels. Successful nurserymen, who know that a very deep, well-prepared soil is best for trees, often furnish some of the finest specimens of profitable farming in the heavy crops which they obtain from vacant portions of their land, which should encourage farmers to give up superficial and adopt thorough culture."

James J. H. Gregory makes, in a Treatise on Root Culture, the following statement:

"The crop of Mr. Albert Fehring, of Hingham, Mass., was sixty tons of roots, and if the tops were in the usual proportion of about one-third, they weighed twenty tons more, giving the enormous yield of eighty tons of green feed from one acre of ground. The crop raised on Deer Island, in Boston harbor, was about seventy tons to the acre, with a like proportion of tops the total yield must have been over a hundred tons. In the sewage farms of England eighty tons of roots has been raised on one acre of land. Fehring applied fifteen cords of manure to his acre of ground. Of the quantity of the Deer Island crop, I regret not to have data."

Mr. K. M. Chrysler, of North Hector, N. Y., reports that he has raised of Lane's Imperial and Vilmorin's sugar beet, forty tons per acre. Mr. Richard N. Bailey, of Wiscasset, Me., reports forty tons. Mr. Albert Fehring, of Hingham, Mass., reports sixty tons. Messrs. Smith & Powell, of Syracuse, report sixty tons per acre, and I could give many more names of men who have raised from forty to fifty tons per acre, last year, which was a very unfavorable one for any root crops. W. W. Harris, of Cumberland, who is president of the Maine State Board of Agriculture, raised per acre twenty-six tons, on which he applied eighteen dollar's worth of Stockbridge fertilizer per acre; he expresses his conviction that if he had doubled the quantity of

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manure he would have doubled his beet crop. H. I. Libby, president of the First National Bank at Portland, had twenty tons raised on his farm. The manager of the farm belonging to the Reform School on Cape Elizabeth, near Portland, raised two acres which yielded fully as much as either of the former.

With proper cultivation and manuring there is no good reason why every farmer who tries should not raise twenty or more tons per acre. The influence this would exert on American farming in general, can hardly be estimated in dollars and cents. A twenty ton beet crop would not only give the farmer $100 in cash, but would give him besides from seven to eight tons of the very best of green food in the form of tops and leaves, which may be kept all winter and fed to cattle with fine-cut straw, making a most excellent food for milch cows.

The proof these pictures have not been overdrawn is best furnished by the facts ascertained as to what the introduction of beet sugar has done in other countries. Here is an illustration which, though old and often repeated, is like an eternal truth, always new:

On a public occasion, the following inscription was placed on a triumphal arch: "Before the introduction of the beet sugar industry, the arrondisement of Valenciennes produced 695,500 bushels of wheat and fatted 700 oxen. Since the manufacture of beet sugar was introduced the arrondisement of Valenciennes has produced 1,157,750 bushels of wheat, and has fattened 11,500 oxen. A farm of 832 acres, the product of which with ordinary farming, amounted to $8,000 per year, with six years of beet sugar cultivation produced $44,200 per annum."

Considering these facts, it cannot be surprising that many countries have offered assistance to the introduction of the beet sugar industry, foremost among which we find the Province of Quebec, the State of Maine, and even Australia.

I have laid before you the advantages which necessarily must accrue to the farming community at large, and to each individual farmer who can muster courage enough to try a hundred dollar beet crop, on at least one acre, instead of an eleven dollar wheat crop. Allow me now to allude, in a few brief words, to the technical or business part of the beet sugar question. Although the most important part in the manufacture of beet sugar is the supply of sugar beets, these alone are not sufficient, otherwise it would have been long ago a flourishing industry in the Dominion of Canada, where sugar beets have been raised by the hundreds of acres, and have been offered by the thousands of acres if parties could be induced to establish a sugar factory there. But the manufacture, refining or handling of sugar requires large sums of

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money, and in the heretofore uncertain state capitalists are very shy to invest money in any enterprise, especially where, as in the beet sugar business, agriculture forms an indispensable and large part to the success.

The Maine Beet Sugar Company has solved the question, "will it pay to raise sugar beets?" most effectually. Taking it for granted that every farmer who tries one acre of sugar beets will, at least, put this one acre into proper and thorough cultivation, the foreshown figures will convince everyone that he can count on a gross income of $100 from that one acre. The question asked and to be solved is: "Do beets grown on American soil contain as much sugar as those grown in Europe, and do they not contain some ingredient or substance which will prevent the profitable working of the same on a large scale into sugar." These questions have been conclusively answered by the success which the Maine Beet Sugar Company has met with in its working. On the twenty-first day of October, the company began the work of manufacturing sugar from beets, and, within nine days after having the first beet go into the machinery, the company turned out, of all grades of sugars from standard granulated to common concrete or Melado, 94,467 pounds. The quantity of beets consumed to produce this amount of sugar has been 450 tons, and they were used with tops and even dirt on, many having adhering rotten leaves to them. It has to be admitted that the result so far obtained has been fully as good as in the best sugar manufacturing countries, and better than in France. It is one of the peculiarities of the American beet that the heads or leaf-crown contain almost as much sugar as the beet itself, and more than the average beet of France. The question of the complete financial success of the Maine Beet Sugar Company, therefore, was and is centered in the supply of beets. Had this company had but sixty days' supply of beets, it would have earned a profit of not less than fifty per cent.

The quality of sugar and the quantity extracted was satisfactory in the highest degree, and the ease with which it was done could not have been surpassed. But as every new industry which has to start on a very large scale, and cannot be worked with small or cheap machinery, and which requires large quantities of raw material to work, has to overcome extraordinary difficulties, not only in the working itself, but most of all in the procurement of raw material, the Maine Beet Sugar Company adopted, in addition to the process of working green or fresh beets, the somewhat old method of working dried beets. A drying establishment has been erected in the most northern part of the State of Maine, where the beets have been

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sliced and kiln dried, preparatory to transporting them to the sugar factory at Portland. Beets treated by this process are reduced in weight five to one, so that an ordinary good ox team can haul ten tons of beets after they have been dried. The drying process has been adapted to the peculiarities of our country. In Europe the drying of sugar beets is done with coke, while here in this country, far away from communication, where wood is plenty and cheap, coke is not only very expensive, but impossible to procure. After some little experimenting, the success of this drying apparatus can be best understood by comparing figures. According to authentic figures, one ton of beets converted into dry ones cost in Germany nine dollars and twelve cents (this has been the average of four years and includes everything), while the beets dried in Arostook county, in the State of Maine, cost the Maine Beet Sugar Company, delivered at their sugar works at Portland, seven dollars and fifteen cents. I do not mean to assert the working of dried beets to be the best method to be adopted in America, yet it certainly facilitates the drawing of a beet supply from a large territory; enables farmers who live a long distance from transportation to avail themselves of this way of raising sugar beets. It cannot be denied there are objections to this method of sugar making, yet it is calculated to facilitate the introduction of the beet sugar industry into America. The Maine Beet Sugar Company has dried this season 500 tons which, when the whole season's work has been finished, will be converted into sugar, producing probably an additional 125,000 pounds of sugar, and bringing the whole production of the Maine Beet Sugar Company, during the first season, up to about one-quarter million pounds. If any sensible man can show a reason why American farmers would not be benefited by the beet sugar industry, as all European farmers have been, I am one who should like to see it; and if any farmer can tell why it would be a disadvantage for him, or anyone else, to try to raise an acre of sugar beets, I for one should like to hear it. Every American farmer will have hard work and very small returns until he cultivates root crops in regular rotation on his farm. The progress of civilization will force the introduction of the beet sugar industry; a hundred millions of dollars will soon be insufficient to pay for the annual importation of raw sugar; but large as this sum is, it is but small compared with the general improvement the introduction of beet growing will bring to general farming. Wherever introduced, the sugar beet has proved herself the queen of farm crops, and, sooner, or later, the United States will have to acknowledge her superiority over every other sugar-producing plant.

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OUR GRASSES AND THEIR CULTIVATION.

Address at the Annual Meeting, January 22, 1879,
BY ARBA CAMPBELL,
of Oswego, N. Y.

The subject chosen for this occasion, "Our Grasses and their Cultivation," is a very important one to the farmers of our State and nation.

In 1870 the estimated value of the grass crop in our country was no less than $700,000,000, while our corn crop, the next largest, was but two-thirds as much, and our famous king cotton crop but one-half of that sum; and in our State, of the 16,000,000 acres of improved land, I think that two-thirds to three-fourths of it is used for grazing purposes. But notwithstanding the value of this crop and its large acreage, it receives less attention, less thought, less effort, to improve its quality and quantity than any other of our field crops.

We have thousands and thousands of acres of grass lands in our State, of which the crop does not pay its owner two per cent on the cost of the land on which it grows, when one dollar's worth of lime bought, slacked and sown broadcast over our old meadows and pastures white with daisies or red with sorrel, would double the crop, and two dollar's worth more of potash would double it again. I mean all that large portion of our State that is hill land with a clayey loam soil and hard-pan sub-soil, mingled with flat hard stones and gravel that are destitute of lime. But in our valleys and plains where the soil is of drift formation, with round or cobble gravel and stones, which are said to contain much lime, a dressing of lime might be of no value, but with such land I have had no experience with lime as a fertilizer.

But before we proceed further, let us inquire what are the mineral supplies to our grass crop.

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What elements does one ton of our average meadow hay remove from the soil by its growth?

One ton of average meadow hay removes from the soil			*One ton of red clover hay removes from the soil*		
Potash	18¼	lbs.	Potash	31¼	lbs.
Soda	1¼	"	Soda	8¼	"
Lime	23	"	Lime	43½	"
Magnesia	6¼	"	Magnesia	5½	"
Oxide of iron	1¼	"	Oxide of iron	½	"
Sulphuric acid	2¼	"	Sulphuric acid	7	"
Phosphoric acid	6	"	Phosphoric acid	10½	"
Chlorine	2½	"	Chlorine	5¼	"
Silica	37½	"	Silica	5¼	"

This analysis is by Waring, and it so nearly agrees with those of Wolff, Saussure and other agricultural chemists, both of Europe and America, that there can be no doubt about its accuracy. And we learn by it that after leaving out the silica, which is only dissolved sand, has no nutritious value, and is seldom wanting in the soil, that potash and lime supply two-thirds of the plant-food drawn from the soil by our average grass crop, and three-quarters of that used by a clover crop; and lime, which is the cheapest of all mineral fertilizers, is much the larger of the two, while potash is cheap when compared with phosphates. The grass crop, when cut early, uses but a small amount of phosphoric acid. In all our crops, both grass and grain, from three to five times more of phosphate is taken up to form the seeds of the plants than is used to form the stems and leaves.

Professor Johnson says that potash, lime, magnesia, phosphoric acid and sulphuric acid are absolutely necessary for the life of agricultural plants, as is demonstrated by all the experiments hitherto made in studying their influence. This is probably correct, but the quantity of magnesia and sulphuric acid used is small compared with the other three ingredients, and they are both naturally in the soil, and in much of our limestone magnesia is mixed in with the lime. Sulphuric acid is supplied by plastering. My experience has been that when my soils are well supplied with potash, lime and phosphoric acid, I get good crops both of grass and grain.

The best way with old, worn-out pastures and meadows is, no doubt, to plow them and manure well if you have barn manure; but, if you have not, sow ten bushels of lime, 200 pounds of superphosphate, which will cost three dollars, and two or three dollars' worth of potash salts, or muriate of potash, to the acre. And after cropping two or three years with these supplies yearly, then seed again and you will not have

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much trouble in your grass seed not growing, or with poor crops of hay, or with poor, weedy pastures.

My rule is never to sow a grain crop on my land without a dressing of ten loads of barn manure, or from five to ten dollars' worth of these fertilizers to the acre. And I have always got my pay back for the fertilizers in the first year's crop. But never buy grass seed that is hulled by thrashing it; it will grow, no doubt, under the most favorable circumstances, but if it is cold or dry for a week or two after sowing, the hulled seeds will rot, and the young shoots die before they get large enough to draw their nourishment from the soil. It is much cheaper, on the average, to pay a little more for seeds with the hulls on. But when plowing and reseeding of our grass lands cannot be afforded, sow potash and lime, broadcast, by all means; but too much must not be expected of lime the first year. It dissolves very slowly, and it takes 1,000 pounds of water to hold one pound of lime in solution.

In warm. wet seasons like our last, too much water falls for a hard-pan soil. It lies on the surface and mingles with the vegetable matter and they both become sour, and our grass fields are red with sorrel or white with daisies. They spring up as an effort of nature to throw off this excess of acidity in the soil, for a sour soil can no more grow a sweet grass than our wives can make a sweet pudding with flour, eggs and vinegar. And if a little grass grows on such a soil it is sour and poor, and will not make good, sweet butter or much flesh. Potash, lime, soda and magnesia are alkalies; in chemistry it takes an alkali to neutralize an acid. They have the same effect on our soils, and when applied daisies and sorrel disappear.

For example, last summer I mowed two meadows lying side by side. They were seeded with wheat the year before. The one was manured with fifteen loads of barn manure to the acre; it was first red with sorrel and later white with daisies, and cut but a light crop of poor hay. The other was manured with 200 pounds of phosphate, ten bushels of lime, twenty-five of ashes and ten bushels of hen manure per acre, and bore neither sorrel nor daisies, but cut twenty-two tons of excellent hay on eight and a half acres.

We now come to the cutting and curing of our hay crop. At what time and in what manner should this be done?

Professor Emil Wolff, of the Royal Academy of Würtemberg, found, as the average of fifteen different analyses, that young grass, cut and dried, yielded eighty-eight per cent of nutritious matter; but if cut and dried when in bloom, it would yield only sixty-two per

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cent; and if not cut till ripe, it would yield only thirty-one per cent of nutrition. Or, in other words, if we begin our haying before it begins to head, and finish by the time it comes in bloom, our mow of hay will average seventy-five per cent of nutrition; but if we wait until it comes in bloom to begin and finish when ripe, as is the usual custom, our hay mow will average only forty- six and a half per cent of nutrition; or two tons of the early cut hay has seven per cent more nutritious value than three tons of the late-cut hay. Should we lose that much in weight by early cutting? Certainly not, if we mow twice, and two crops cut early will not exhaust the soil as much as one crop cut late.

The next objection is the expense of curing hay when cut so green, and this is a serious objection, if it is to be dried in the cock for the purpose of preserving its green color. But let me say that the value of this green color is only a myth, and as a food of no value. Professor Johnson says of it: Chlorophyll—*i. e.*, leaf-green, is the name applied to the substance which occasions the green color in vegetation, etc. It might be supposed that it constitutes a large portion of the leaves of vegetation, but the fact is quite otherwise. The green parts of plants are only at their surface, and in quantity no greater than the colored particles of a dye. Pfaundler analyzed it and found it to contain carbon, oxygen and hydrogen, or charcoal, air and moisture When extracted, as a color, it fades readily on exposure to the light as it does when green hay is exposed to the light.

I have experimented for years upon this subject. I have cut the green grass, dried one part of it in a dark part of my barn to preserve its green color. The other part was exposed to the sun and dew from two to five days, till it bleached nearly white, and brought samples before our farmers' club, and not a man could tell which was which by the taste. I have fed the light to one ox and the green to the other ox in the yoke, and after they had eaten a short time, turned them around so that each ox should feed from the other sample, but they were too wise to be fooled by the green color.

For years it has been my practice to cut my hay pretty green and let it lie as it falls from the mower, taking the dews, and rain if it falls, till it is so dry that it will not heat in the mow, but will weigh out as many tons in the winter as I put in in the summer. If it is very thick it has to be turned, of course; and I think I make a great saving, both in the condition of my animals and the amount of hay consumed. But do not be afraid of getting it too dry if cut green enough; there will be no loss of falling off of leaves, and it will

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readily absorb moisture from the atmosphere until it is just as moist and just as dry as the atmosphere in which it is kept. A ton of hay, weighed from your mow in August when the atmosphere is at ninety degrees F., will weigh 2,200 lbs. in January with the atmosphere at zero, the atmosphere being much moister.

On our western planes and in California the grass grows up in May and June, and when the dry season sets in, in July and August, it dies down and lies there, taking the dews and what little rain there is till the next spring. And yet the cattle live and get fat upon it. If one or two nights' dew will ruin our hay, what would one or two hundred nights do for theirs?

Again, we put our potatoes, turnips, parsnips, rice and other vegetables in water, and boil them without preceptible loss of nutrition, and they are made up of just the same nutritious elements that our hay crop is. We spend much time and labor to dry our hay in the cock to preserve this green color; we then cut it and wet it again, put it in a box, and steam it, but as soon as the steam is turned on, this green color fades to a yellow or brown. But if boiling or steaming will not dissolve those nutritious elements or change them to a gas, how much damage can a night or two's dew-fall do? And we can mow our hay-fields, twice, dry and put up the hay in the way I suggest, with as little labor as it will take to cut it once when in bloom, and make the hay by drying in the cock.

Again, our hay loses much by drying in the cock by sweating. I have not been able to find a table of analysis showing the exact loss to hay at the different stages of fermentation; but I find one by De Saussure, of Switzerland, in malting barley, showing the comparative principle of loss. The barley was soaked in cold water forty-eight hours, till the berry became soft. A sample of it was then dried and analyzed, but no loss was found except a little coloring matter, which came from the hulls. It was then taken out of the water, and allowed to drain as dry as it would, then spread on the malting floor, and soon began to ferment and sweat, throwing the moisture to the surface in large drops, just as hay in the cock sweats. It was carefully watched and shoveled over, and the heat never allowed to get above sixty-two degrees F. It was kept three to four days, all the time at a temperature between fifty-five and sixty-two, till the sprouts started. Fermentation was then checked by drying rapidly in a kiln, as it is in our bread by baking in an oven. After drying, it was analyzed again, and different samples had lost by this fermentation from eight to twelve per cent. Now, if the loss was ten per cent to this barley, and

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the heat kept below sixty-two degrees, what must the loss be to our hay when the heat often goes up to 100, 200 and 300 degrees? Blood heat is at 100, and our hay-stacks or mows will not feel hot to our hands till the heat gets above 100.

When a hay-cock or mow smokes, the color of that smoke is from the charcoal made by the internal burning of the sugar and starch in the hay, forced outward and upward by the conversion of the gelatin, albumen and fibrine into carbonic acid gas and ammonia, just as wood is converted into those gases when burnt in our stoves. The strong hay smell given off comes from the ammonia, scented by the hay, passing off into the atmosphere.

I was brought up and lived on a farm till I was twenty-seven years old. I then engaged in another business. But, retaining my early attachment for the soil, in 1855 I bought another farm of 200 acres, within three miles of Owego village. It was so run down that I bought it for fifteen dollars the acre, and the neighbors then said to me: "What could you be thinking of to buy that poor farm? It is the poorest land in the county; it will grow nothing but daisies and sorrel."

I immediately began to use lime upon it and soon got rid of the daisies and sorrel, and have been reading agricultural works and trying experiments ever since. And this farm, with but 175 acres of cleared land, with but little on it except lime and a little plaster and the manure made on the farm, wintered last winter seventy head of cattle, and we carried over twenty tons of hay, pastured last summer eighty-five head, and are this winter wintering eighty head. It was not till within the last five years that I could make up my mind that it would pay me to pay forty dollars per ton for phosphate or twenty dollars for potash salts, but they are cheaper now and I am using them both freely.

This farm was used the first twelve years as a sheep-farm, and for the last twelve has been let on shares as a dairy farm, and has paid me for the last twelve years a net income of a little over $1,000 per year above all expenses.

I am well aware of our farmers' attachment to the usages and practices of their fathers and grandfathers, and cannot expect them to take much stock in my system of grass cultivation and curing, but shall hope that many of you will try some experiments upon this subject, and I think in less time than twenty-four years you will learn to avoid late cutting of your hay, or allowing it to ferment or heat in the least in the cock, mow or stack. In my judgment, at least one-third of our hay-crop is lost by these two mistakes. If our

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grasses were cut green, and properly dried before their nutritious elements begin to change into silica and woody fibre, I see no reason why our animals, when properly housed and fed, should not thrive upon them in winter just as well as they do in summer when eating them in the pastures.

Let us all remember that God made our soil and gave it to man for his inheritance; and the first command ever given by God to man was "Go forth, increase and multiply, subdue the soil and make it abundantly fruitful;" but 6,000 years have come and gone since this command was given, and his soil is not half subdued, or but very little made abundantly fruitful. God made a mineral kingdom to feed a vegetable, and a vegtable kingdom to feed an animal, and he gave man dominion over the fish of the sea, the fowls of the air and the beasts of the field, that he might feed upon them, and utilize their labor to help do this work, subdue the soil and make it fruitful; but not till within the last 100 years did men even learn that there was such a science as agricultural chemistry, and that God had stored up in his rocks and caves, sands and earth, an abundance of every mineral supply to make the most barren sand fruitful. Lime is found in abundance in many of the counties of our State; plaster, also, which supplies sulphuric acid. Potash is found in many caves in the form of mica, feldspar and nitre, and in the ashes of all vegetation. In the green sands of New Jersey and our western plains, phosphoric acid is supplied from bones, and by the South Carolina and other rocks. Magnesia is found in abundance at Hoboken, N. J., and mixed with limestone in many quarries. Soda is supplied by salt, which is chloride of sodium. And all that man has to do is to use those minerals and apply them to our soils in proper proportions, and they will soon become abundantly fruitful.

Much of the food of plants is taken from the atmosphere in the form of carbonic acid gas and ammonia, but over those man has but little control. Every fire that burns; every hay-cock, stack or mow that sweats; every atom of vegetable or animal matter that decays, throws off those gases. They ascend into the atmosphere and God stores them up in his clouds; they absorb moisture, and in time form into drops of rain and fall again to the earth to feed another crop of vegetation.

In God's work there is no waste of either time or matter. Every atom is utilized. Not a sparrow falls but he taketh heed of it, and returns it earth to earth, ashes to ashes, and atmosphere to atmosphere — each part from whence it came.

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BUTTER-MAKING.

Read at the Annual Meeting, January 22, 1879,
By SAMUEL E. LEWIS,
of Oxford, Chenango County, N. Y.

Never, perhaps, in the history of butter-making, has it become so necessary, or so much for the interest of the dairyman to make a fine keeping article as at the present time.

When prices are tending upward, and the demand exceeds the supply or production, anything and everything called butter sells readily. But at the present time, when there is an over-production and a competitor for the poorer grades in tallow or oleomargarine, it becomes a necessity for us to improve the quality of our butter.

If it is true, as has been stated on good authority, that not over ten per cent of the butter made can be classed as fine, then I think that I am safe in saying that oleomargarine butter comes in competition with fifty per cent of the butter made, and I state from good authority that there is now made daily in the United States about 260,000 pounds of this oleomargarine butter, which is put upon our home and foreign markets. Now, this does not come in competition with our fine butter, for the demand for fine butter now exceeds the supply, and the only way to drive the oleomargarine out of the market is for us to make better butter. It cannot be done by legislation.

The amount of our productions and importations in figures seem almost fabulous. It is estimated that 25,000,000 pounds of our butter will be exported the present year. The low prices have stimulated exporters to take our better grades, and the more they take of this the more they want of it, and this leaves the poorer grades to accumulate in our markets.

Now, I am going to give you my opinion as to what injures and spoils so much of our butter, viz.:

First. — Uncleanliness in manufacturing.
Second. — Too much acid in the cream.
Third. — Casein in the decomposed state left in the butter.
Fourth. — Too much friction on the butter in making.

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As I proceed, I propose to show the effect that the different points that I have made have on butter in its manufacture; also how to remedy these defects.

Every dairyman ought to know that cleanliness in every respect is essential to the making of fine butter. Foul milking stables, or yards, impure water, any odors from any decomposition the milk readily absorbs, and the cream having a stronger affinity for taint that is in the milk, transmits it to the butter, thereby affecting its quality. In this respect we are far behind our competitors over the water. In England, France and Holland the cream is mostly churned sweet, and the butter is not salted, and it is kept a long time. This is effected by cleanliness in everything pertaining to the making of their butter.

RAISING OF CREAM.

Much has been written and published on the subject of the raising of the cream. I think that Mr. O. S. Bliss, of Vermont, in an article in the "American Dairyman" of October 3, struck the key-note. He says: "The force and the only force which raises cream is gravity acting indirectly upon it. Gravity always acts downward, while cream rises or moves upward; no two bodies can occupy the same space in the same time — milk being heavier than cream is acted on by gravity with greater force, and it presses downward between the particles of cream and thrusts them aside and upward." This is Mr. Bliss' theory, and the result of my experimenting proves him to be correct. Now, the colder the water applied to the milk the greater the force of this gravity, and the sooner the cream will rise. Cream rises fastest with falling temperature of the milk. The important point now is how to apply the cold to the milk to produce this effect. On this point I have spent much time in experimenting.

Dr. J. B. Marquis, of Chenango county, the patentee of the Marquis Magic Milk pan, wanted me to test his pan; his theory was, that cold settles and that heat rises, and that the cream, or oil, being more of a non-conductor than the water part of the milk, the cold should be applied to the milk, in the milk, near the top just under the cream. I saw that here was a field for making what I deemed important test experiments. I consented to test his pan on one condition; that was that he should put a glass in his pans so that I could see the progress of the cream raising. Also that he would have a water chamber under the bottom of his pans. These pans held about 400 lbs. of milk, the milk being about eighteen inches deep in them. The water was forced through what he termed a refrigerating cylinder, adjust-

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able to any height in the milk. In my first experiment I ran the water at a temperature of forty-six degrees through the cylinder, and under the bottom of the pan; the glass showed that the cream was nearly all up in three hours. My next experiment I passed the water through the cylinder only; had no water under the bottom of the pan. This time the cream was nearly all up in three hours. I placed the cylinder three inches from the top of the milk, and during the cooling of the milk there was a difference of fifteen degrees in the milk — the bottom being fifteen degrees colder than the top. I found that the colder the water used the greater the force of specific gravity, and the sooner the cream would rise.

Mr. L. S. Hardin, of Kentucky, made a statement that there were three grades to cream, and that each grade made a different grade of butter, the first cream that rises making the best butter. Now, I doubt if the cream can all be got out of the milk, for every time the milk is skimmed and stirred up, and reset, more cream will rise as long as the milk remains sweet. The full butter-sacs rise first, partially filled second, and then those having so little butter in them, that there is but very little difference in the specific gravity of these sacs and the water in the milk.

To test Mr. Hardin's theory, I set the milk in the Marquis pans holding 2,000 lbs. each. I set twelve and twenty-four hours, although there did not much cream rise after four hours. The skimming was done by drawing the milk from under the cream; this made a more perfect separation; the milk was drawn into a cheese vat and set twenty-four hours. I got quite a thick cream off this second cream; put the first cream to churning at a temperature of sixty-two degrees; second cream at a temperature of sixty-seven degrees, both at the same time. First cream came in about thirty minutes; churned on the second cream about three hours with no signs of butter. This same experiment was made in a neighboring factory where they churned this second cream five hours without getting any butter.

Acid in Cream.

Much of the butter made is, in fact, injured or spoiled by too much acid in the cream. Acid is the first sign of decomposition in milk. I select the following table of analysis as a fair average of milk, viz:

Water	87.02
Casein	4.48

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Butter	3.13	
Milk sugar	4.77	
Ash	.60	= 100

You will please notice that there is over a pound more of sugar in 100 pounds of milk than there is of butter. The first acid in milk or cream is what I term the sugar acid. This acid acts upon and destroys the sugar. The second acid or lacteal acid acts upon and destroys the fatty oils. At this stage the cream or milk wheys off, and decomposition is so far advanced as to produce rancidity in the butter. The sugar in the milk is what gives the butter its fine, sweet taste — the volatile, fatty oils give butter its fine aroma. Destroy those two parts and you have oleomargarine butter without making it from tallow.

The finest butter is made from sweet cream, but its surroundings must be perfect, for it is more sensitive to odors than butter made from sour cream. Cream should be churned in the first stage of the sugar acid. Too much acid in the cream is the cause of the white curd specks in the butter. The acid, to a certain extent, performs the office of rennet acting upon the casein, thereby producing thin curd specks; their presence in butter will, after a time, give the butter a cheesey smell and taste. It is generally supposed that the sacs holding the butter in the milk are formed of casein, and that acid softens them so that they break easier in churning. This I deny; they are not casein, but a membrane, and acid toughens them until decomposition is so far advanced as to spoil the butter.

CHURNS AND CHURNING.

Much has been said and written about churns and churning. Now, churning is a very simple process; it is simply producing a friction on the sacs holding the butter until they break and let the butter loose. The churn should be such, or the cream should be in such a condition, that an equal friction be produced upon the cream while churning. If the friction is not equal the sacs will not all break at the same time; hence a percentage of loss.

The up and down dash churn, if the cream be so thick that it adheres to the cover and sides of the churn; this is not getting an equal friction with the cream in the bottom of the churn. The Blanchard churn has the same objection. The way to remedy this is, if the cream be thick, thin it with skim milk or water so it will not adhere to the churn.

In churning thick cream the revolving and oscillating churns will

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give the best per cent of butter; even in these the cream should not be too thick to get fine butter.

Cream from different milkings should be mixed long enough before churning for it to assimilate and become as one cream. The cream on one milking might require more friction than the cream on milk not so old. So if these two creams were skimmed and mixed, and churned at once, there will be a loss of a per cent of butter.

Cream for churning should be put at a temperature from fifty-eight to sixty-two degrees, according to the conditions of the cream and the atmosphere.

Handling of the Butter.

Butter should not be allowed to gather compact in the buttermilk. Stop churning when the butter is in a granulated state. Churn just enough so that the buttermilk will separate from the butter; then drain or draw the buttermilk from the churn through a hair sieve. This does not admit of any loss, by letting the butter remain in the churn. Then wash the butter by turning water on to the butter in the churn. If the buttermilk be very thick, it may require washing in two waters. This process rinses the buttermilk or casein out of the butter without breaking the grain of the butter. Take pains to get all the casein out of the butter that you can, for the following reasons, viz.: Butter churned from sour, thick cream, the casein or buttermilk is in a stage of decomposition, and any casein left in the butter will soon form a butyric acid, spoiling the flavor of the butter, and in a high temperature the salt will not arrest the decomposition of the casein left in the butter. It is the casein in butter that spoils it by being exposed to the atmosphere, so you see the necessity of separating the casein from the butter from the churn.

When the butter is washed do not gather it in the churn with the dash, but take it off the water with the ladle and sieve, then put it upon the butter-worker in the granulated state, and gather the butter when you work in the salt. I prefer for a butter-worker an inclined plane in the form or shape of a letter A, with a round lever for warm weather. The lever should never be allowed to slip or slide on the butter, always going on to the butter in a rolling or pressing motion. Have a little wooden shovel to handle and to turn the butter. Butter does not require but little working at a time; just enough to equalize and cause the salt to dissolve. Do not undertake to force any foreign matter from your butter by working, but give it a little more time and the dissolving of the salt will do this.

You will see that by this process of handling butter much friction

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is saved from the old way; if the grain of the butter is broke down or salved the butter will not keep. Avoid all the friction possible on your butter in handling. Too much friction also destroys the fine flavor of butter. Salt according to taste and market. If to firkin, to hold it requires a little more than one ounce to the pound.

There should always be milk enough skimmed in with the cream to give the butter a clean bright look when it comes. Butter churned from clear cream with but little milk in it will have an oily look to it when it comes. This oily look shows a breaking down of the grain of the butter.

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REPORT OF SOME INJURIOUS INSECTS OF THE YEAR 1878.

By J. A. LINTNER.

It should not be necessary, and I trust it is not, that extended remarks should be offered to the members of the New York State Agricultural Society upon the importance of the study of insects in their economic relations. You are all prepared to bear ready witness to the truth that the difficulties which you have to encounter, are not so much with an unproductive soil as with over-productive insects: the field, the orchard and the garden, bear one unvarying testimony to this truth. You have all felt the tax imposed upon your labor and its expected product, through insect injuries, yet few of you are prepared to realize the regular recurrence of this tax and its magnitude, from the insidious secrecy with which it is levied and enforced. A moment's reflection will convince you that a half crop, as the direct result of the depredations of the wheat-midge, the Hessian-fly, the grain-aphis, the army-worm — or a score of other pests which might be enumerated, can have but this interpretation — a levy of fifty per cent upon the aggregate value of the crop — usually submitted to without an effort being made to resist its recurrence another year. Were the State to make this assessment — not to spread it through myriads of ravenous stomachs as excrementa upon the ground, but to mould and pile up the enduring granite of yonder noble structure, in which succeeding generations may feel an honest pride — would it be as quietly submitted to? That crop is an exceptional one which the insect does not tithe, often without our knowledge. The poverty and starvation which the Rocky Mountain locust has borne with it through our western States and Territories, tells of destruction of entire crops as complete as if swept by a fire.

To present these losses in a somewhat comprehensible form, it may be stated that a careful estimate of losses through insect ravages within the United States, based upon the census returns of the value of the agricultural products of the country, and estimates of injuries inflicted by certain insects within certain States, gives as the aggregate

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of annual losses, two hundred millions of dollars ($200,000,000). The loss occasioned by the chinch-bug alone, in Illinois, in a single year, was computed at seventy-three millions of dollars ($73,000,000).

Without dwelling longer upon these considerations, permit me to pass directly to a brief notice of a few injurious insects which have come within my notice during the past year — a year, it may be incidentally remarked, so signalized by a scarcity of insects, that the work of collecting for the cabinet and for scientific study, was almost abandoned. The report made at the meeting of the American Association for the Advancement of Science, at St. Louis, in August last, from entomologists representing the various portions of the United States, was unanimous, that of the Noctuidæ (a family of the moths comprising the cut-worms and a large proportion of the species most detrimental to the agriculturist), not one individual was to be found where a hundred were to be met with the preceding year.

Your attention will first be invited to an insect which now for the first time claims local habitation and a name in our list of insect foes. It may be called

THE CLOVER-SEED FLY — *Cecidomyia trifolii* n. sp.*

Early in the month of June, 1877, some heads of red clover (*Trifolium pratense*) were brought to me by Mr. T. L. Harison, Secretary of the New York State Agricultural Society, and my attention was called to some small, worm-like creatures contained within the heads, and apparently feeding upon the seeds. From their acutely elliptical form and vermiform movements when taken from the clover and placed upon a table, they seemed to be the larvæ of some species of dipterous insect. All the writers upon economic entomology at my command, American and European, were searched for a notice of the insect, but no mention of it was found.

During the same month, examination of heads of clover collected at West Albany, at West Troy, and it is believed at one or two other localities in the State, was made by Mr. Charles H. Peck, State Botanist, whose attention had been called to the insect, and the larvæ were discovered within them.

On the nineteenth of the same month, during a field-meeting of the Troy Scientific Association, held at Schroon Lake, Warren county, N. Y., the larvæ, in small numbers, were found by me in some heads plucked in the village of Schroon. Subsequently my

* Subsequently changed to *C. leguminicola*; see Report for the year 1879.

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engagements were of such a nature that I made no further observations on the "clover-seed worm" during the season.

In the fore part of August, 1878, heads of red clover were handed to me by Mr. Harison, which were said to have been taken from an infested field, but I failed to detect the presence of larvæ. On the nineteenth of the same month, six heads were sent from the President of your Society, Mr. George W. Hoffman, of Elmira, N. Y. They contained very few seeds, but the examination was not sufficiently thorough to enable me to say whether the seeds had not been formed, or if their substance had been devoured by the larvæ — the latter was thought at the time to be the explanation of their paucity. Within some of the pods larvæ were found very nearly filling their interior.

Upon picking the flowers apart and strewing them upon a black surface, the larvæ readily left their concealment and commenced traveling over the table. The flowers were shaken several times during a half hour, until no more larvæ emerged from them. A number of the pods were then opened, but all were found deserted by the occupants which they may have contained. It is probable that the larger number of the larvæ had matured and left the heads before they were received by me.

Fifty larvæ were obtained from the six clover heads. Of these, ten were deposited in alcohol for more careful study than could be given them at the time; the remainder were placed in a small pot containing damp sand, in which they all buried themselves within an hour thereafter — some entering it as quickly as the operation could be performed, and others after a longer or shorter preliminary travel.

Their appearance at this time was as follows: The head, small and acute; the body, elliptical, moderately constricted at the joints, flattened on the sides, rather rounded behind, without feet, of a pinkish color approaching orange; length eight-hundredths of an inch.

A later microscopic examination of the larvæ which had been preserved in alcohol, disclosed characters which led me to refer them, with very little doubt, to the Cecidomyidæ — and probably to Cecidomyia — the genus to which belong, among many others, two species, the names of which are only too familiar to our agriculturists — the Hessian-fly and the wheat-midge (*Cecidomyia destructor* and *Diplosis tritici* of entomological literature). Dr. Hagen, of Cambridge, to whom I submitted my alcoholic specimens, also recognized them as belonging to Cecidomyia. He has, in addition, kindly examined the European authorities in economical entomology contained in the extensive library at Cambridge, and has informed me that he finds no record

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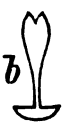
therein of any Cecidomyia or allied form preying upon the seeds of clover. As by far the larger number of this family are monophagous —*i. e.*, living on a single species of plant or closely allied species, there is every probability that from the secrecy with which this minute insect has been prosecuting its work, and possibly from its not yet having multiplied to a formidable extent, it has remained, until within the past two years, undetected, and that the present is its first introduction to public notice.

Baron Osten-Sacken, in his excellent paper *On the North American Cecidomyidæ*, pp. 173-205 of the *Monograph of the Diptera of North America*, by H. Loew, Part 1, groups the N. A. species in three categories, viz.: *a*, those of which the perfect insect is described but its habits unknown; *b*, gall or larva known, but perfect insect unknown; *c*, perfect insect described and its habits known. Under *b*, the category in which our new species falls, thirty-two species are arranged, whence it may be seen that there is ample authority for not awaiting the knowledge of the perfect insect before the bestowment of the scientific name.

The alcoholic specimens of the larvæ, as seen under a low magnifying power, presented the following features: Head (outline with following segment represented at *a*) subacute, subtriangular, slightly rounded laterally on its posterior half, giving that portion a subquadrangular form; a short cylindrical, horny process at its tip, and two longer antennal processes, cylindrical, tapering apically. Body delicately shagreened; laterally at about the middle of each segment, a short, fleshy papilliform process, with two short bristles of unequal length, near the posterior of the segment; posterior segment bilobed, each lobe armed with two short fleshy processes, of which the outer is the longer; "breast bone" of a pale yellowish color, the portion exposed appearing as represented at *b*—its projecting end divided into two rather blunt, laterally rounded points. A dorsal row of processes similar to the lateral ones is suspected, but was not definitely made out.



In placing the larvæ under a one-fifth objective, for their more critical examination, they were unfortunately so badly crushed as to be unserviceable for further description.

The Cecidomyidæ, in their larval and pupal stages, are known to possess remarkable vitality, and there is, therefore, good reason to believe that the perfect fly will soon be obtained from some, at least, of the thirty larvæ which buried themselves last August in the sand which I gave them, as before stated, and that its description may then

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be secured. Dr. Fitch, in his account of the wheat-midge (*Sixth Report Insects of New York*, p. 57) writes: "When a larva is but half-grown, we have seen that although deprived of food it does not die, and though kept from moisture for many months it does not dry up so as to perish. Thus no extremity of hunger or of thirst seems to have power to kill them."

The above statement gives encouragement that the possibly premature burial of my larvæ, and their having been meanwhile kept for the greater part of the time in a warm room without moisture, may not have proved fatal to them, but that they are safely hybernating within their minute globular cocoons, which there would be but the slightest chance of detecting for the purpose of examination, even if a very close search were made for them. We will hope that these cocoons, within the ensuing two months, from the warm temperature to which they have been subjected hastening their development, will open by a smoothly cut hemispherical lid, and disclose the delicate, tiny fly, in all probability new to science, and with which, it is apprehended we may hereafter become too well acquainted.

The extent of injury which the clover-seed fly may have already inflicted, or is destined in the future to inflict, can at the present be only conjectured. It is possible that, for many years past, this little creature, so insignificant in size, has been secretly levying a heavy tax upon the clover-seed culture of our State, seriously diminishing the annual yield, while its operations have been charged to unfavorable climatic conditions, or to imperfect fertilization of the blossoms through a scarcity of that important if not indispensable agent in the work of fertilization—the humble-bee. Or it may have but entered on a career, which if unchecked by parasitic agency, will result in the entire destruction of the seed in infested districts, compelling, as did its congenor *Diplosis tritici* with the wheat, its importation from localities where the pest may not abound.

The range of this insect will be an interesting subject of inquiry for the coming season. Does it occur throughout the State of New York, and is it to be found in other of the States? Will it be detected in Europe, from which its food-plant was introduced, now that its lurking-place is known? Is its attack confined to the *Trifolium pratense*, or does it extend to the *T. hybridum* (the Alsike clover) and other species?

To the extent that my engagements permit, it will be my pleasure to investigate the history of this interesting insect the coming season, promising, as it does, a considerable degree of economic importance.

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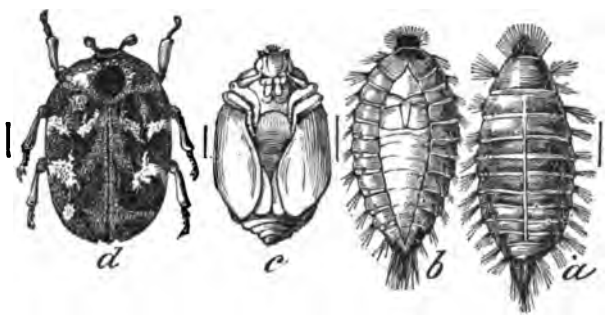
THE CARPET-BUG—*Anthrenus scrophulariæ* (Linn.).

In my communication presented to this Society two years ago (*Trans. N. Y. State Agricul. Soc.* vol. xxxii, p. 240), I gave a brief account of this new insect pest which was exciting much alarm in several portions of our country, from the serious depredations which it was making upon carpets, and the great difficulty that had been experienced in the attempts made to check its ravages. A more extended notice of the insect, giving descriptions of the different stages, together with illustrations of the same, has since been prepared by me and contributed to the *Thirtieth Annual Report of the State Museum of Natural History*, advance sheets of which have been printed and a copy placed in the library of the State Agricultural Society. The illustrations of the transformations are herewith presented. At *a* the larva, popularly known as "the bug," is represented—the form in which it is usually found in its hiding place beneath the borders of carpets during the period of its ravages. At *b*, a cast skin of the larva is shown, several of which are thrown off during its growth, and numbers of which may be found in the crevices of the floors of infested houses. Fig. *c* represents the pupa, which is retained within the skin of the larva, and may be seen during this stage, through the fissure on the back shown in *b*. When fully matured, the pupa-case also splits open on the back, disclosing the wing-covers of the beetle, beautifully marked in white, black and red. At *d* the beetle is represented. The figures are enlarged — the accompanying lines indicating the natural size.



Some additional information respecting the insect has been obtained since the publication of the account above referred to, which is herewith, in part, presented.

The apprehension was then expressed that when the threatened multiplication of this beetle reached the extent that it would be found feeding upon flowers after the habit of its congener, the museum-pest, the *Anthrenus varius*, the comfort of carpeted floors would hardly be allowed us. Already we have learned that it is no longer confined

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within doors, where an occasional specimen may be captured upon window-panes or articles of clothing, for under date of September 14, 1878, Mr. A. S. Fuller, of the Rural New-Yorker, has communicated to me the following information: "I have taken the *A. scrophulariæ* in goodly numbers this season, feeding on *Spiræa aruncus* — on the pollen, not on the honey or leaves. It will undoubtedly visit other species of the Spiræa blooming in summer." Mr. Fuller suggests that these flowers will serve as an excellent bait by means of which the beetles can be collected and destroyed.

Public attention was first drawn to the ravages of this insect, through newspaper notice, in the State of New York, in the year 1874. It has been recently announced that it had been observed in the city of Boston two years earlier — in 1872. Since that time — perhaps the year of its introduction — it has multiplied to so great an extent as to have occasioned serious alarm. In a late communication upon the subject to the Boston Society of Natural History, Dr. Hagen, of the Museum of Comparative Zoölogy at Cambridge, stated that its increase the past summer (of 1878) was so great as to be entirely contrary to the laws of probability. It was evident that it had propagated and spread in an alarming manner, and in illustration thereof, he presents the following statement: "A gentleman had the entire outfit of his recently married daughter destroyed; another had furnished a new house, and had to begin the same task over again; a lady found all her winter clothing damaged, and before she was aware of the presence of the depredator, her carpets were entirely destroyed."

These, and many similar cases were investigated, and it was discovered that about three-fourths of the infested carpets had been purchased at a certain carpet store, the proprietor of which had bought a large stock, which he was disposing of at reduced rates.

In consideration of the grave results of introducing an infested carpet in one's home, it was recommended to the Bostonians that every new carpet or rug should be considered as dangerous, and first exposed in strong sunshine in the open air and strongly beaten, before laying it on the floor. The common custom of ordering new carpets from the stores to be laid down at once, was pronounced as attended with great danger. Dr. Hagen also recommended, as a means of preventing the entrance of the insects, that the joinings of the floors (their favorite habitat) should be filled with the softest common tallow, and that tallowed paper should be placed underneath the carpets, extending in strips of a foot or two around the room adjoining the walls.

In addition to the reason assigned for the above recommendation,

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viz.: That the tallow is avoided by the larvæ of the carpet-beetle, as it would readily attach itself to them and close their spiracles or breathing-pores, it may be stated, that the odor of tallow is disagreeable and repellant to a large number of insects, and that it has long been the custom to protect woolen goods from the clothes-moth, during the summer months, by placing among them a tallow candle wrapped in paper. For some time past, I have employed the same protective means for the preservation of my entomological collection from the attack of the *Dermestes lardarius* and the *Anthrenus varius*, by placing tallow candles among my cases, and small pieces of the same within the cases. Some interesting experiments recently made with a colony of Dermestes, probably the familiar larder-beetle (see *Canadian Entomologist*, vol. x, p. 141, 1878), gave the following results: They were confined in a glass jar, and a piece of camphor placed therein. At first they manifested some uneasiness, but in a minute or two commenced traveling about and over the camphor with entire unconcern. Upon a small piece of tallow being dropped in the jar, the effect was instantaneous and ludicrous — a regular stampede ensued. The beetles fled precipitately to the side of the jar, and after endeavoring to effect their escape, they huddled together in a mass, where they remained so long as observed. The jar was set aside, and upon looking at it again a fortnight thereafter, only one *dead* beetle was found of the large family. It is presumable that they died soon after their exposure to the tallow, and had eaten up the dead bodies of one another.

In one of my early communications on this insect, it was stated that I had found no mention of its preying upon carpets or other woolens in Europe, where it had been long known, and the suggestion was advanced that it may have developed a new taste with its introduction in this country. Since that statement was made, mention has been brought to my notice of its feeding upon clothing in Europe. It is written of it: "It is common in houses, where it can become very obnoxious by the destruction of furs, clothes, animal collections, and even leather and dried plants. The obnoxious larva is common in closets and rooms in the attic, where it finds dead flies, and from whence it enters other rooms." It is usually met with in Europe on flowers, such as roses and tulips, and often on fruit trees. A popular name for it, in some parts of the continent, is "the flower beetle." The fact of its not having been known as a carpet pest in Europe, is doubtless owing to the very few carpets that are used in that country — their use there being almost wholly confined to the winter season,

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while during the summer months, the period in which the larvæ commit their ravages, they are withdrawn from the floors and carefully stored and protected from harm.

It is a very common insect in Europe. In a catalogue of the Coleoptera of Norway, by H. Tiebke, published in 1875 (*Catalogum Coleoptorum Insectorum Norvegicorum*), it is recorded as "of frequent occurrence in various localities in Norway [thirteen cited], principally upon umbelliferous flowers, during the months of June, July and August."

Judging from the rate of increase and distribution of other insect pests introduced from the Eastern world, and from the history thus far of the species under consideration, there is every reason to believe that before many years have elapsed, this most unwelcome guest of our homes will become as abundant among us as it is, at present, in Europe. When that time arrives, a carpeted floor, now regarded as a necessity in almost the humblest home, will then be the exception, unless more effectual measures against the new enemy shall have been discovered. But with the rest which we predict for the looms of our carpet manufacturers, we foresee a wonderfully increased importation of Persian rugs. The pleas which will come up from the length and breadth of our land for the coveted rug will be too powerful to resist, when urged by coaxing lips with such arguments as — "so much more cleanly, and then you know, so much cheaper than a carpet; for, not reaching to the walls, under which the horrid carpet-bug hides, we shall not have to buy a new one every year."

The Flea— *Pulex irritans* (Linn.).

From a neighboring city and an adjoining State (Boston, Massachusetts), comes notes of alarm, occasioned by the sudden increase during the year 1877, and an invasion, in 1878, of the common flea. Dr. Hagen states, that eleven years ago, while this well-known insect was satisfactorily common in New York and Canada, it was so rare in New England that he did not believe that it existed there at all. It was a long time before he could procure a human flea for an examination which he desired to make — all which were brought to him were dog or cat fleas. Simultaneous with the above invasion, the cat flea became exceedingly abundant. In many of the streets of the suburbs of Boston, cats might be seen having their body nearly covered with the Persian insect powder. From Medford, in Massachusetts, a phial of flea eggs was received, which a lady had taken from a spot on her sofa which her pet cat had appropriated for her resting place; and

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similar instances of the propagation of the cat flea were elsewhere observed.

Many residences in the city of Boston and in its suburbs have become infested by the human flea, in such number as seriously to detract from the comfort of carpeted floors. To those suffering from this remarkable invasion of their homes by a most annoying pest, of wonderful powers of increase, the diminutive size and agility of which renders its capture by hand almost an impossibility, Dr. Hagen has been able to suggest a very simple method of capture and destruction, which has long been practiced in Poland, that "paradise of fleas," and which it may be well for us to bear in mind against a time of need, should the Massachusetts invasion extend to New York. It is simply to place on the floor of the infested room at night, a wash-bowl filled with water, and in the middle of it a lighted candle. Like many other insects, the fleas are attracted to the light, and leaping toward it are caught in the water and drowned. Persons who had experimented with the above trap, reported it as most effectual, and as giving promise of a speedy release from the affliction. In some instances the water of the bowl was stated to have been "black with fleas" caught during the night.

A NEW CORN-DEPREDATOR — *Euryomia Inda* (Linn.).

From various sections of the State of New York and of New England, complaints have been made of an insect which was proving very injurious to standing corn, by burrowing beneath the husks and feeding upon the kernels. All the accounts stated that it had never before been known to prey upon corn. The following notice of it is extracted from a New Haven, Conn., paper of September 7, 1878:

"*The Corn-Bug.*— The corn-fields of the interior of the State are suffering from a brown-colored, six-legged bug, having a broad body and a small head, which starts at the tips of the ears and works through to the butt, devouring the kernels. Meriden and Burlington report the ravages of the pest. A correspondent from the latter place says: 'Fields of corn are ruined almost in a single day.' A gentleman, of Woodbridge, picked twenty of the bugs off two ears of corn, August thirtieth. The general impression among farmers is, that this pest will prove more disastrous than even the potato bug."

From examples received, it proved to be no new insect, but one that had long been known to science, and familiar to all entomologists as *Cetonia Inda*. The Cetonians are pre-eminently flower-beetles, their mouth organs being provided with a brush of hairs with which

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to collect the pollen of the flowers which they frequent, as those of the golden-rod, *et cet.* They are diurnal in their habits, flying actively about, with a loud, humming noise like that of bees, in the warm and bright sunshine. There are eighteen species of the Cetoniidæ known to North America,* of which the *C. Inda*, or, as it has been designated since the subdivision of the old genus of Cetonia, the *Euryomia Inda*, is our most common species. It is a thick-bodied beetle, measuring about six-tenths of an inch in length. Harris describes it as having a broad body, very obtuse behind, with a triangular thorax, and a little wedge-shaped piece on each side between the hinder angles of the thorax and shoulders of the wing-covers; the latter, taken together form an oblong square, but are somewhat notched or widely scalloped on the middle of the outer edges. The head and thorax are dark copper-brown or almost black, and thickly covered with short greenish-yellow hairs; the wing-cases are light yellowish-brown, but changeable with pearly and metallic tints, and spattered with numerous, irregular, black spots; the underside of the body, which is very hairy, is of a black color, with the edges of the rings and the legs dull red.

That one of the flower-beetles should present itself to our notice as a corn pest, has excited no little surprise even among entomologists. Its habit of frequenting sap-trees in the spring to partake of the sap, has long been known, and it has also been chargeable with burrowing into ripe peaches to feast upon the sweet and luscious pulp. An entomological correspondent of the New Haven paper from which we have quoted above, Mr. H. F. Bassett, questions the statements made that this insect is the author of the injuries credited to it, and says: "It would be just like it to prowl around and in ears of corn that some bird or beast had meddled with, but to strip the husks off and gnaw the cobs, would be quite beyond the power of any flower-eating beetle known to me, their mouth not being fitted for hard or difficult work."

The above-mentioned writer also states that he had looked over a large portion of our economic entomological literature, consisting of the New York reports of Dr. Fitch, the Missouri reports of Riley, the reports of the Canadian Entomolog cal Society, and the volumes of the American Entomologist, without finding any reference to this species as particularly destructive to anything but sweet, juicy fruits. Upon further search, I find that he had overlooked a statement made by Dr. Le Baron, formerly State Entomologist of Illinois, in his Fourth Annual Report (1874), where, in a very brief reference to

* Later check lists recognise thirty-two species of the tribe *Cetoniini*.

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E. Inda, he says of it: "It is sometimes troublesome by burrowing into ripe fruit, and also by feeding upon sweet corn in the milk."

The idea advanced by Mr. Bassett, above quoted, that this insect is not alone chargeable with the injury to the corn, finds support in a communication to the *Country Gentleman* of January 16, 1879, from a correspondent at Flushing, N. Y., which at the same time adds another count to the formidable bill of indictment against that unmitigated nuisance, the English sparrow! The correspondent writes: "I had fifty or sixty hills of corn planted in my garden, which came up and thrived wonderfully, and we found it deliciously sweet; so did the English sparrows. For a considerable time we found; after it was fully ripe, many ears were eaten for five or six inches from the top, and upon examining the places closely, I found one or two bugs in each one about the size of the Colorado bug, with a mottled back, something like in color to a tortoise shell, with considerable hair on the under side and legs, which I picked off and destroyed. This I followed up for three or four days, but one morning, going to the corn earlier than usual, I saw on one ear seven of the sparrows making a new opening where there was none before. Of course, here was the solution. After I had put a coat, pantaloons and hat on some sticks nailed together and stood it up in the middle of the corn, I had no more trouble with them. I had supposed that the bugs did the mischief, but they had only entered where the birds had made an opening."

It is quite probable that the past year was one in which the species occurred in unusual abundance, and its ordinary food not being met with in sufficient quantity to supply the wants of such a host, it was led to resort to the juices of the tender corn, as an exceptional article of food. Its large numbers the past season give no assurance, fortunately, of an increased or even an equal number the present year, for it is well known to entomologists that a year noted for the invasion of some particular species of insects may be followed by one when the same insect may be rarely met with.

Dr. Harris' statement that this insect has its second brood about the middle of September, in Massachusetts, may need some modification. Examples of this brood were found as early as the middle of August, near Bridgeport, Conn. Mr. Bassett records its having been seen by him feeding on the sap which flows from certain woody galls on oak trees. The intense bitterness or acidity of most galls would seem to be very unlike the sweets for which it manifests so great partiality.

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Another species of this genus, the *Euryomia melancholica* Gory of which a figure is given in the *American Entomologist*, vol. ii, p. 61 (fig. 39), is frequently found in Illinois, boring into apples, and according to Prof. Riley, is fond of eating into the flowers and fruits of a variety of plants.

The Peach-Twig Moth — *Anarsia lineatella* (Zeller).

In June last, some examples were sent to me for determination, which proved to be the above insect. They were accompanied by the following note: "The inclosed insects are very injurious to the terminal branches of the peach-tree. They deposit their eggs, either very early in the spring, just as the buds are swelling, or the fall previous. The terminal buds of all the higher and outer branches are so stung, and although these buds develop into seemingly fine branches, in a few weeks they wither and drop off. The centers of the twigs are first destroyed by these insects while in the larva state. I placed several of the twigs in a large bottle, and secured the inclosed specimens from them. One of the pupæ seems to be destroyed by some parasite, as it looks as if it was filled with eggs."

From the above statement of the habits of the insect, and the effect of its operations upon the twigs, the specimens of the moth received, although in too poor condition, if sent alone, for identification, were readily referable to the insect popularly known as the peach-twig moth. From its small size and structural characters, it is numbered among the Microlepidoptera of the family of the Tineidæ.

In 1860, Dr. Clemens bred this insect from larvæ which he found, on the 16th of June, infesting plum trees, and described it under the specific name of *pruinella*, doubtfully referring it to the genus *Anarsia* (*Proceedings Academy Natural Sciences of Philadelphia*, 1860, page 169). Subsequently he identified it with the European species, *Anarsia lineatella* of Europe, thereby adding it to the long list of insect pests which Europe has given us. Prof. Riley obtained specimens of the same moth from peach twigs, and on submitting examples to Prof. Zeller, they were pronounced identical with the European insect.

The first published notice of the operations of this insect in this country which we have met with, appears in the report of the Entomologist (Mr. Glover) of the Department of Agriculture at Washington, published in the Annual Report of the Department for 1872. Mr. Glover says of it:

"In examining peach orchards in the neighborhood of the Mary-

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land Agricultural College, about the first week in May, almost all the young twigs of the trees were observed to be killed at the extreme end for a distance of from one to two and a-half inches, and the terminal buds entirely destroyed. On cutting open these dying twigs, the injury was found to be caused by a very minute caterpillar, which, entering the twig near a bud, had entirely eaten the pith and the interior, leaving only its 'frass' and the exuding gum to mark the spot where it had entered. When confined in a glass case, after about a couple of weeks, several of the larvæ left the injured twigs and formed very loose cocoons on the sides of the box, or among the rubbish and old leaves lying scattered on the earth, and in about six to ten days, the perfect moth appeared [last of May]. * * * The tail of the pupa is attached to a little button of silk, in an exceedingly slight cocoon. There was scarcely a single young tree in the peach orchard examined that was not more or less injured by this little pest, and at least as many as from twenty to fifty injured twigs were found on some very young trees. After the insect leaves the twig, the injured part dries up and breaks off. This insect was also seen, though in much smaller numbers, last season, in Maryland and Virginia. Apple trees are also similarly injured in a similar manner in Maryland, and it is probable that the damage is done by the same worm."

"The larvæ are about 0.25 inch in length; head black; body dark reddish-brown, with lighter rings — the third ring being more conspicuous and whitish. The moth is quite small, and measures from 0.40 to 0.60 of an inch in expanse of wings, and is of a pale gray color, with a few blackish spots on the upper wings."

From a recent communication of Professor Comstock, of Cornell University, Ithaca, N. Y., made to the Western New York Horticultural Society, we have information of the ravages of this insect in several portions of the State of New York. The statement of the habits of the caterpillar made by Professor Comstock, differs in some particulars from that of Mr. Glover, above quoted. According to his observations, "it destroys the terminal leaf-bud, and sometimes the lateral buds, in the following manner: The young caterpillar begins its work in the spring at the time, or soon after, the shoots begin to grow. These, when from one-half to one inch in length, are punctured at the base and eaten completely off. The leaves of the bud unfold and then wither. The twig, although severed, does not drop off, but is held in place by a gummy substance. All the twigs on some trees are destroyed, especially on two-year old trees. Mr.

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Green, of Clifton, N. Y., had 100 trees infested. The larvæ became full-grown during the latter part of May or early in June. Specimens collected June tenth, were found to have changed to pupæ June fourteenth." The period of their emerging as moths was not observed, as they were found dead in their breeding-cage some time during the summer.

In addition to this insect's occurrence at Ithaca, it was also observed at Rochester, Lockport and at Jordan Station, Onondaga county. Its operations have not come under my personal notice, but its presence in the eastern portion of our State is very probable, from statements made to me two years ago, of an affection of some peach trees in Schenectady and Albany.

In the Annual Report of the Entomological Society of Ontario for the year 1872, published in 1873, we learn that the ravages of this insect are not confined to the peach, plum and perhaps the apple, but that it also occurs under very different conditions and affecting a very different food-plant. In this report, Mr. Wm. Saunders, the editor of the Canadian Entomologist, describes the insect under the name of the *strawberry root or crown-borer*. During the years 1868 and 1869, it was very destructive in certain grounds at St. Thomas, Ontario, the caterpillar eating irregular channels in various directions through the crown and larger roots of the strawberry plants, causing them to wither and die. Mr. Saunders gives a minute description of the caterpillar, narrates its history, states that it probably has two annual broods, and quotes the description of the moth given by Dr. Clemens, under the name of *pruinella*, as before stated. For convenience of reference, we copy the description:

"Head and face pale gray; thorax, dark gray. Labial palpi, dark fuscous externally, and pale gray at the end; terminal joint gray, dusted with dark fuscous. Antennæ grayish, annulated with dark brown. Fore wings gray, dusted with blackish-brown, with a few blackish-brown spots along the costa, the largest in the middle, and short blackish-brown streaks on the median nervure, subcostal in the fold, and one or two at the tip of the wing; cilia fuscous gray. Hind wings fuscous gray; cilia gray, tinted with yellowish."

Specimens of the larvæ obtained late in the season were found alive within their thin silken cocoons on the twelfth of January, rendering it probable that this brood hybernate in the larval state, and transform to pupæ in the spring, a short time before their appearance in their perfect state.

The above *strawberry root or crown-borer* of Saunders should not be

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confounded with the *strawberry crown-borer* of Riley — an insect belonging not to the order of Lepidoptera, but to the Coleoptera, of the family commonly known as snout-beetles or weevils. This latter insect has been described and figured in its larval and perfect stages by Prof. Riley (*Third Report on the Insects of Missouri*, p. 42, fig. 14, 1871) as *Analcis fragrariæ*. So far as known, it is confined to the Mississippi valley, and has not, to our knowledge, been reported from the Eastern States. Its habit of boring down through the crown of the strawberry plant into the pith and eating through the more woody portions, is very similar to that recorded of the *Anarsia lineatella*, and the ravages of the two insects in localities where they conjointly occur, are liable to be confounded. The general use of common names for our insects, birds, fishes, mammals, etc., very often results in serious confusion, when with little difficulty the scientific name, which always indicates the object referred to, could be acquired.

It is gratifying to know, that in all probability, this destructive pest has already been attacked by a parasite which promises to perform an effective part in checking its ravages. The "pupa apparently filled with parasitic eggs," referred to in the communication accompanying the examples sent to me, is the dead body of a caterpillar, distended to its utmost capacity by the presence of no less than fifty-one pupa-cases of apparently some hymenopterous insect. They had been crushed in their transit through the mail, preventing the perfect insect being obtained from them, or even an approximate reference of their relationship. Prof. Riley has also received examples of the caterpillars infested with parasites.

Should the increase of this insect not be prevented by parasitic agency, then the most effectual means of arresting it will be the cutting off of the infested terminal twigs of the trees upon which it occurs—readily to be distinguished by the drying up of the leaves—and burning them with their contained borers. This should be done during the month of May or early in June, before the larvæ have attained their maturity, after which they leave their burrows to seek some sheltered place beneath the loose bark of the trunk, leaves upon the ground, or elsewhere, where they may construct their cocoons and undergo their final transformation. Strawberry plants giving indication of their presence, should be promptly uprooted and burned.

N. Y. STATE MUSEUM OF NATURAL HISTORY, *January* 22, 1879.

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THE CONFLICT BETWEEN AMERICAN AND EUROPEAN AGRICULTURE.

An Address before the New York State Agricultural Society,
By HORATIO SEYMOUR,
At the Annual Meeting, Wednesday, January 21, 1880.

I congratulate the Society upon its long and growing usefulness. The names of many of New York's best and leading citizens have been enrolled among its members. In future it will not be less potent in promoting the welfare of the State than it has been in the past.

By your rules it is my duty, as the outgoing President, to speak about the interests it represents. My subject is, "The Conflict between American and European Agriculture." At the State fair, in September, I laid before the officers of this Association a paper with regard to this topic. I will avoid, as far as I can, repeating what I then stated.

Agriculture rises above all other of our pursuits in interest and importance. Ever beneficent, it carries life and comfort into the homes of man. It usually bears the aspect of an humble servitor, and is sometimes overlooked when the public mind is filled with more exciting topics. In the end it asserts its value, and brings the world back to a sense of the truth that all wealth and prosperity are based upon the soil and the labor which brings forth its products.

We can find in history no instance when this fact has been brought home to men's minds in a way more striking, or on a scale so broad, or with influences so far-reaching, as by the present condition of agriculture on this continent and in Europe. Here it displays its bounties. There, nature withholds its accustomed products, and want and suffering creep into the homes of labor. On this continent it has given life and energy to all other pursuits and industries. It has lifted the burthens of debt from our country, given it credit with the world, and honor in the eyes of all nations. In Europe, the want of food has injured industry, and has embarrassed governments. In this country it has solved problems in finance which perplexed our legislators. While they doubted and disputed, the statesmanship of the plow

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found the remedies for our troubles. The tillers of the soil have done the work. They followed God's fiat and not that of men. The sweat of the brow, and not the schemes of the brain, have rescued us from our perplexities. In Europe, the condition of agriculture makes suffering which threatens great social and political changes.

What is the significance of these portents? The limit of an address will admit only of a meagre sketch of facts and conclusions. When we try to forecast the future, we may fall into many errors and overlook many truths; but it is our duty, at times, when there are impending changes, to scan the horizon and learn what we can of coming events.

ARE THE ADVANTAGES WHICH OUR FARMERS NOW HAVE DUE TO ACCIDENTAL CAUSES, OR CAN THEY HOLD THEM FOR ENDURING REASONS.

The immediate causes of our prosperity have been the abundance of our crops and a failure in those of Europe. We cannot count upon these in our plans for the future. The next summer may reverse the fact, and Europe may produce an abundance, and we may lose from unfavorable influences upon our fields. Will our advantages pass away with the year just closed, or have there been developed underlying conditions which have been gradually forming, and which are now to show themselves with great power and in grand proportions? This is, for us, the overshadowing question of the day, and it will lead us into many investigations before it is solved. It is the most important that can be pressed upon the minds of our people. It concerns every citizen, every family, every pursuit. If we push on blindly and assume that the coming years are to make plenty here and want elsewhere, we may be speedily overwhelmed by disaster. I believe that our country has entered upon a new era in its relationship with Europe. While it is not probable that our exports of food the next year will equal those of the past, still the channels of commerce which have been opened will not be closed, but will gradually grow wider and deeper. These will make permanent changes in our dealings with that continent.

WHAT WILL GROW OUT OF THE FACT THAT STEAMSHIPS AND ELECTRIC CABLES HAVE DRAWN THE OLD AND NEW WORLDS INTO CLOSE CONNECTION?

I know that in entering upon this discussion I am in danger of being drawn beyond the limits of a sober address about farming, and that some things I shall say may seem remote from my topic. But

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our agriculture is now so far-reaching in its influences, that I ask for a wider range of speech than is usual upon such occasions.

When America was discovered, it was so remote from Europe, in view of the difficulty of reaching it, that it was called a new world. It was regarded as we now look upon planets, and for more than a century but little was known about it. We could only be visited by long and dangerous voyages. Measuring distance by time, it was a year's distance from Europe. But art and science have, as to time and intercourse, drawn the continents together until they are so closely moored that it is easier to pass from one to the other than it is to traverse their respective territories. This fact, that North America with its vast extent of fertile vacant lands, thus almost touches Europe with its over-crowded population, is one which excites the most varied speculations with regard to the results which must follow, bearing upon all phases of civilization, politics and power. History tells of no event more striking or significant. There is now what properly may be called a conflict between our agriculture and theirs. During the past year we have fairly "bombarded Europe with casks and barrels of animal and vegetable food." While these relieve famine, they also excite alarm in many quarters by their effects, not only upon their agriculture, but upon social and political organizations. It has become a contest between American farmers and European landowners. Let us compare the power and resources of the combatants. As the Canadas are occupied by a people speaking the same language and living under laws similar to our own, I include them in my terms when I speak of our side in this competition. When I speak of our continent I do not include Mexico. It is, geographically, one of the connecting links between North and South America, and not strictly a part of either.

What Territories are Held by the Parties in this Contest?

North America exceeds Europe in extent and fertility. Its boundaries reach to both of the great oceans of the earth. Its soil and climate are more favorable to abundance and variety of food. Although our population is only one-sixth that of Europe, we have enough to meet its wants in this year of its distress, and all that we have parted with has made no scarcity here. It has not carried up the price of food as much as it has advanced the wages of labor. The variety of our farm products is a protection against disasters from unfavorable seasons, as some grains are helped by causes which harm others. If an entire wheat crop should be cut off, it would be a great loss, but it

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would make no hunger here, for it amounts to only a quarter of the product of Indian corn. We have not only a greater variety of the fruits of the earth, but our climate gives them to us in succession, which adds greatly to their value and to the comfort and enjoyment of our people. Before winter has relaxed its hold upon the north we begin from the borders of the Gulf of Mexico to get fruits and vegetables. Free and cheap intercourse between all parts of our common country gives the luxuries of that semi-tropical region to all sections. Following the northward course of the sun, the season for these varied products is prolonged. We look to their approach from the south to the north rather than to an almanac, to tell us when the summer glow shall give life to vegetation over our vast continent.

THE INFLUENCES OF THE TOPOGRAPHY OF THE CONTINENTS UPON THEIR AGRICULTURE.

But it is not only in extent of territory and in abundance and variety of products that nature favors us. While in Europe short rivers and narrow valleys tell of frequent ranges of high lands which hinder commerce; with us lakes and rivers bind our States together with silver links in ways that give us a ready and cheap exchange of all that we raise or make. Spread out before you the maps of the two continents, and note the different influences of mountain ranges and river courses. Leaving out of view the great streams and plains in bleak northern Russia, and of the Danube in Eastern Europe, and you will see that the rivers are navigable for short distances, and their valleys are of small extent. The Danube is not as long as the Missouri branch of the Mississippi river. You may divide the valley of the Mississippi into sections which will be equal in area to Great Britain, France, Germany, Austria, Italy and Spain combined, and still there will be about one-sixth left to represent minor countries. Those I have named have only 1,073,000, while the valley of the Mississippi has 1,257,000 square miles of territory. Its waters make about ten thousand miles of navigation, more or less perfect, while its valleys give level routes to a vast system of railways. In our country we have now, of these, nearly ninety thousand miles in length, and they are rapidly extending into new regions.

THE GROWTH OF OUR POPULATION.

But natural advantages do not affect the commerce of the world until they are developed by the enterprise and industry of man. One hundred years ago the population of the United States was three

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millions, and that of Great Britain, when we broke away from its control, was about seven times as many. In ten years our numbers will be about twice those of the United Kingdom. We now have fifty millions, and less than the usual ratio of increase will give us sixty-two millions in 1890. Many who now live will see one hundred millions of busy inhabitants within our borders. There may be a falling off in the ratio of our increase during the next thirty years, but not enough to lower it within the numbers I have stated. If the rulers of Europe adhere to their policies of ambition and wars; if their inhabitants continue to fly from their homes; if their governments are pestilential in their destruction of life, we shall see greater movements to our shores than any heretofore witnessed. In our contest with Europe we take and will continue to take each year, by immigration, greater numbers of "prisoners of peace" than war has ever wrested from one nation and forced under the domination of another. They are not victims of force; they are not unwilling captives; they join our side and help us on to greatness and power. They bring us arts, and skill, and labor. They enlarge the minds and sympathies of our people by lifting them above mere provincial prejudice. The mingled European races have a vigor superior to any single lineage. We are forming what is not yet fully developed—the American character. Those who study the influence of this intercourse upon the common ground of our country will be impressed with its improvements of all minds and characters. The citizens of Rome were not merely Italians. They adopted those of other nations, and gave the freedom of their city to towns and provinces. Our ways to greatness are more beneficent. Immigration is better than invasions and conquests. If any one of the so-called great powers of Europe should take captive from one of its rivals numbers equal to a single year's immigration to this country, how deep would be the concern and how widespread the agitation over the question of the balance of power! How many councils would be held; how many diplomats would bewilder themselves and the world, about plans to check the growing power of the successful country! Immigrants do not merely give us numbers, but also wealth in a way unknown elsewhere. The money they bring with them amounts in the aggregate to a large sum. But this is unimportant in comparison with another fact: We have many millions of acres of rich lands, which the government holds at a nominal price, or which it will give to actual settlers by our homestead laws. While they are vacant they are of no value. When, in the course of a few years, a million of

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hardy immigrants, usually in the prime of life, land on our coast, they may be without wealth; but the moment this multitude of poor men and women plant themselves upon the millions of acres of land, of no previous value, the union of two kinds of poverty evolves, as if by a chemical action, enormous wealth! Mere occupations before a crop is raised give prices to the soil which make a vast amount of real wealth. This does not fall away as time goes on, but it grows each year. In our new States, the wealth of our farmers does not merely come from the sum he gets for his products, but beyond this, the land he took up for a homestead, or which he bought for a trifle, gains a value which makes an estate ranging from a few to many thousand dollars in value. Wealth cannot grow in this way in Europe. There, prices at which lands are bought and sold vary but little in the course of a life-time, and all that the owner gains is the value of what he raises. He has no estate growing up under him. He cannot, as is frequently the case with us, spend each year all he earns, and then leave to his family land which has increased fifty or a hundred fold in value since he became its owner. It is this fact which gives our country its swift increase of wealth. This is known to the people of Europe, for the constant correspondence between those who come here and their friends at their old homes makes them more intelligent about our affairs than their rulers or the wealthy classes. For these reasons, as well as to escape the burthen of military duty, thousands of young Germans, in the vigor of youth, get away from their native land to ours. Every attempt to hold them by force makes their government odious in their eyes.

THE INFLUENCE OF POLITICAL ORGANIZATIONS UPON THE PROSPERITY AND AGRICULTURE OF THE TWO CONTINENTS.

Beyond extent of territory, variety of productions, facilities for intercourse and growth of numbers, there is another advantage we enjoy. We cannot correctly scan the future unless we regard the political conditions of the two continents. Europe is cut up into many nationalities, differing in language, laws and customs. To make clear what its people suffer from this cause, and what we gain from free intercourse between all parts of our continent, draw upon our map divisions which show the size of Great Britain, France, Germany, Austria, Spain and Italy. Their united areas will a little more than cover the territory east of the Mississippi—not one-third of our country. The smaller nationalities can be represented at such places as you may find convenient. Arrange upon our map these

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countries in ways which will not only show their areas as compared with those of each other and with ours, but also so that their positions shall be preserved as far as possible. How long could we endure such division of territory; the barriers to intercourse, aggravated by differences of language and laws; the burthens of great armies; the evils of national hates, and the curse of bloody wars? The boundaries to each of these divisions would limit the spread of knowledge, the progress of civilization and the growth of sympathies among mankind. Every industry would be disturbed and taxed by the cost of great armies. Their rulers would stand as they now do in Europe, armed against each other, as if they deemed their fellow monarchs robbers who watch their chance for plunder. In the light of present civilization, their diplomacy has sunk so low in regard to truth and honor that it tends to demoralize the world. The governments of Europe thus delineated upon the map of our country will teach us not only the drawbacks and evils from which they suffer, but will also give us more clear views of our own blessings, and teach us to value as we should this union, not only of States, but of hearts and hands of those who dwell in our broad country. A day's railway travel in any direction would take us out of the limits of our own, and would bring us into the boundaries of a foreign country. We could not go into the west, nor travel south, without getting beyond the bounds where our language, customs and laws prevail. We could not take those journeys we are accustomed to make to the Mississippi, nor to the southern States, without mastering many languages, and then being treated as strangers and aliens, and, in many cases, as hostile aliens. Shut up within narrow limits, we should imbibe the prejudices which mark the people of European countries, and which they display when they first land on our shores. This delineation on our territory of Europe will tell why it has been cursed with wars, revolutions and bloody changes of relative power. Universal peace is almost unknown on that continent. There, armed neutrality is counted as peace.

Let us brush off this picture of Europe from our map; let us rub out the hateful lines of divisions, and when we look at it again, we will see, as we have not seen before, why peaceful agriculture and all industries have advantages here unknown elsewhere. We shall breathe more freely when we feel that this whole broad continent is ours, for I include the Canadas in this view of our intercourse.

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THE DIVISION OF OUR AGRICULTURE INTO GRAND DEPARTMENTS, AND THE EFFECTS OF THIS UPON FARMING AND FARMERS, AND IN GIVING STABILITY TO OUR UNION.

In smaller countries, farmers labor to meet the wants of those about them. They are confined to home markets, and they seek to raise the crops which will meet their limited needs. Their pursuits in such cases do not stir the minds or teach the wants and conditions of other regions and populations. The reverse of this is true with us. Our agriculture is shaping itself into grand departments, each covering extents greater than those of most countries. These lead to improvements in their several pursuits, which cannot be developed when carried on on a smaller scale. The southern States raise cotton and tobacco. The vast region from Texas to Canada, lying on the foothills and plains east of the Rocky Mountains, is becoming the range for cattle, which are sent to the markets of the eastern States and Europe. In many of the great western States Indian corn is the leading product, and one that enables the farmers to send to the markets of the world an enormous quantity of beef, and pork, and lard. At the north-west they raise wheat and other grains, while New York, New England and Pennsylvania lead in dairying. It is true that in these great divisions the farmers do not confine themselves exclusively to the products I have named; yet in each, one of them takes the lead, and is raised on a scale unknown heretofore. Each shapes the business, commerce and transportation of its region in ways which cheapen production and the cost of reaching markets.

When the Pacific States get rid of their gold, there will be another development of agriculture more enriching and beneficial than all that can be dug from mines. God's blessing does not go with the gambling chances of finding lucre in the bowels of the earth, as it does with the industry which works with Him in bringing forth the fruits of the soil.

This system improves not only farming, but the farmers as well. The influences of these great departments of agriculture are not more striking in their results upon production than they are upon the intelligence of the producers. It cannot be said of them that they are open to the reproach sometimes made to those who labor upon land, that they become torpid, gross and heavy in thought and action. Diffused intelligence gives them a control over mechanical powers. For the culture of great areas we have thus labor under labor, machinery under the control of those who till the soil; thus enlarging their ability to subdue nature and make it yield its fruits to human

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wants. Here, again, let me ask you to study your maps; unless you keep one in constant view, you cannot get clear ideas of this country. It is too large, too varied in its climate and physical features, to be clearly described by words. We need its picture before us. Let us begin at Texas, and note the modes of life along the slopes of the Rocky Mountains and plains to the borders of Canada. We see energy, courage and intelligence developed and displayed in their exciting pursuits. Those engaged in them must not only exercise wisdom in the care and improvement of their herds, but they must know much about the wants and markets of the East and Europe. They are active in cutting down all uncalled-for charges, and in opening new railroad and water routes. Those who deal in making and selling articles which are used throughout the world, are made more intelligent than those who deal with local markets. They must learn the condition and wants of other people and the laws of commerce. This not only promotes farming, but it improves the mind of the farmer when he thus deals with states and nations afar off. The same truths apply to those who make provisions in States where Indian corn is the chief product. They learn how pork must be cured and packed to meet the views of different markets; how every part of the animal they kill is made valuable by a knowledge of the uses to which it can be put. The hair is sent in one direction, the feet in another, and even the blood is carefully preserved for use in some remote quarter. Where wheat is raised on a large scale, the same truths are manifested. In none are they brought out so distinctly and in such detail as in dairy regions. As most of the cheese and much of the butter made by us is sent to Great Britain, or to the countries on the continent, it is necessary to consult the tastes of foreigners. With regard to these articles they are critical. They are apt to vary in quality, and if this is inferior, they will command but small prices. Skill is required in their production, and the details concern many problems in chemistry and with regard to animal and vegetable life. To meet all these questions numerous societies are organized, where all things relating to this business are discussed. Those engaged in it have been educated upon many subjects which do not, upon first view, seem to be connected with their pursuits. In the country, upon the days when sales are made, the state of the London market is made known by the use of the ocean cable. The prices of gold and of freights are written upon a blackboard, where they can be seen by all. I have on several occasions attended with men of prominence, of our own or of foreign countries, the sale of these products, and they all expressed surprise

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when they learned the methods, the intelligence and the range of topics discussed by buyers and sellers.

The active and widespread intelligence thus generated by our departments for the production, and our methods for the sale of products, give assurance of our ability to hold the ground we have gained in the markets of the world. The intercourse and intelligence which grow out of these great departments of agriculture do not merely elevate our farmers and give us commercial success, they make the bonds which hold our Union in firm compact. Party passions may threaten it; ambitious purposes may, for a time, stir up sectional prejudices; but since the late sad war, the growth of agriculture, commerce and intercourse has made a conservative, intelligent influence, which will rebuke passions and purposes which threaten peace and harmony. It is pleasant and assuring to know that nature, in its forms and pursuits, gives life and strength to our political association, and inspires hope that our Union will have nature's endurance.

Effects of our Agriculture upon the Social and Political Systems of Europe.

If all the statements I have made are correct, still the fact remains that the people of Europe have heretofore been able to raise most of the food they need. Why can they not hereafter, with the same labor, on the same soil, raise enough to supply their wants, except for the small amount which they have heretofore imported? Why can we expect, with ordinary seasons, that we can sell them more than we have done in past years; why, although we may raise grain and make provisions for less than they can, may not the effect of this be merely to reduce the price which farmers will get and not the amount of food they will produce? Our exports to Europe were large and growing before the failure of its crops. These questions bring into view some facts of great interest in many respects. In the first place, where farmers own their lands, as they do with us, all that they can get for what they sell goes to those who labor upon the soil. But as a rule in Europe, and particularly in Great Britain, what is made upon farms must support at least two and sometimes four classes of persons; the tenant who does the work; the landlords, and usually some agents or middlemen, who hire and sub-let to tenants. Church rates and many other charges must also be paid. When our cheap grains reach their markets, as they will hereafter, and govern the prices of produce, they disturb existing arrangements. The tenant must have enough to live upon then as now; taxes and tithes must be paid, and

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only what is left will go to the owners. This class are to suffer. If you read the debates in Parliament, you will see that an attempt is made to excite sympathy for British farmers. But the parties who really are affected are British landlords. The conflict is not between American and British farmers, but American and British land-owners. If the cost of produce falls, rents must come down, for tenants can pay no more, and landlords will get no more than prices will give. The tenant cannot live upon less than he now gets, and the loss must fall upon the owner.

Beyond this diminution of revenues, there is a difficulty which affects the structure of political and social organizations. The nobility are landlords. In Britain they are recognized as one of the estates of the government. A class of them constitutes the House of Lords. The theory of most of the European governments is, that families who have personal and political rights beyond the mass of the people, to uphold the dignity and power of their rank, should have large estates, and these must in the main consist of lands. As this rank is hereditary, it must be strengthened by hereditary estates. Personal wealth is too evanescent, too changeable to admit of its being secured by entails. But the tenure of lands can be so arranged that they may be held by families, and made safe from division by the laws of entail and of primogeniture. As Mr. Gladstone has said: "In England inequality lies embedded in the very basis of the social structure. * * * Heredity is in the heart's core of Englishmen.

Our cheap and fertile lands, and the low cost of sending our products to Europe, may work great changes in the condition of the higher classes and the tenures of real estate. This explains the uneasiness they have shown when we send food to relieve the hunger of their people. It is not this merciful work, but the fear that hereafter we may reduce their resources, which disturbs them. If we do, their large estates cannot be held by their present tenures; they must be sold or divided. It is not necessary to dwell upon the great changes this would make in the social and political aspect of Great Britain. The fear of this has already given birth to plans for taxing all food brought from other countries. This has led to a controversy between the landed and manufacturing interests. Britain has been called the workshop of the world; but its artisans are now pressed by competition from many quarters, and are suffering from the low wages they get. How, then, can government tax their food? If this harsh plan be adopted, it will send many of its skilled workmen to us, while those who remain will carry on their trades with increased cost for

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food, when they are subjected to sharp competition by the very workmen driven to this country, where all the necessaries of life are so much cheaper. They must take our grain or give up classes of their people. We cannot foresee what course they will take, for no one can read the debates in Parliament without being struck with the ignorance of members, not only with respect to our States, but their Canadian Colonies. If their statesmen are as ignorant with regard to their dependencies in Asia and Africa as they are about those on this continent, the British Empire is in great peril of dishonor and disaster. The result probably will be that the land-owners will find that they must not only reduce their rents, but they must also change the character of their farm products, and buy most of their grain and many of their provisions from us, and our markets in future will be thus enlarged.

If they tax imported food, they will break down their manufactures, destroy their home markets and bring disaster upon their country. If the continental nations tax food, in addition to military and other burthens, they will drive away their young and active citizens and reduce their military strength. Monarchs will be safer from bullets when food is cheap and abundant.

Why our Home Markets are made Good by the Character of our Climate.

I have dwelt upon foreign markets, as they deeply concern us; but we must not overlook home transactions, which are still more important. The prosperity which agriculture has given to all other industries will now re-act in its favor and make new demands for its products. Near-by cities and towns make the best customers for our farmers. They buy many things which will not bear long transportation, and which are free from a wide-spread competition. For this reason, in their vicinity, lands bear the highest prices. Those lying near the city of New York sell for sums far beyond those which can be got for better qualities in other quarters. The farmers of New York are helped and not hurt by the currents of commerce from the West. These make the wealth and population of our cities. Manufacturing and mechanical industries, built up by cheap bread, make demands for vegetables, fruit, milk, butter and other articles produced in the immediate vicinity of these home markets I know that some think that if it cost more to bring produce to us, if charges on canals and railroads were higher, that our farms would be increased in value. This is a great error. They would turn away our commerce. They

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would tax not only the food of those engaged in varied industries, but of more than two-thirds of our farmers. They would diminish the population of towns and cities, and thus drive away our best customers. Most of my own property is in farms and land, and I have given much thought and study to this subject. If we suffer our canals to be broken down, and thus lose all control of the course of trade; if we consent to any policy which diverts it from our State, we shall undo the work of our fathers, who, by a wise commercial policy, lifted it up from a low to the highest position in our Union, by drawing the enriching currents of trade through its territories. Along the routes of these, all pursuits and industries have been multiplied. When these are crippled or destroyed, our farms will lose a large share of their value.

The great cities of the world are placed in a belt running round the earth, following a certain mean temperature. As the climates of different latitudes vary, this belt follows temperature wherever it sways to the north or south. There may be more fertile lands north or south of this, but their cities are not as large or farms as valuable. The reason for this is, that there is the most activity and wealth where there are the most wants, with the means for meeting these wants by industry and intelligence. There can be no diffused wealth under the tropics where men wear but scanty clothing; where nature gives food with little or no labor; where slight and open structures make their homes; where there is no use for the thousand things we need, and to produce which great numbers are employed as artisans. Farms are of little value or no value under the tropics. If you go to the arctic regions, you find the same poverty. Oil, or the blubber of seals and whales, must be used to keep up life and warmth. No clothes but those of skins and furs will protect from cold, and close huts make homes. In both of these extremes, of the tropic and arctic regions, there are no varied wants to give the wealth which grows out of numerous pursuits and industries. When we leave these extremes and travel toward the temperate zone, we find increasing wants and wealth, until we reach the belt of the greatest variety of products of industry, arts and sciences. Here we find the highest civilization. Here all kinds of real estate bear the highest prices.

It is in our country that these truths are seen in the clearest light. Here there is more business activity, larger cities and towns in proportion to our population than in any other part of the world. This is due to the fact that we have more wants and more means to meet these wants than any other people. Those of an American are at

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least one-third more than those of an Englishman in the same condition of life. We have arctic winters and tropical summers. Strangers cannot readily understand the variety and quantity of clothing needed here. This leads to the establishment in our towns of great clothing stores, where all articles of apparel are made ready to meet the calls of customers. These supplies are so great and varied that all can be fitted in ways to meet their tastes and wants. These and like arrangements draw to the cities much business, and give to large numbers work which, elsewhere, is done in the country. In winter, our houses and furniture must be of a kind which will fence out cold. I once analyzed the internal commerce of New York, and found that our winter made much the larger part of its volume. We use more furniture in our houses than others. Furnaces to give us heat, which are so common with us, although we have tropical summers, are hardly known in Europe. In winter we store ice for summer use, and in summer our mechanics make implements for winter's work. We must lay in large stores of food for ourselves and cattle. We cannot enumerate all the things that our winters demand beyond those of European countries in the same latitude. We cannot estimate the work and activity which these give to our workshops and factories. When summer comes the change is greater here than elsewhere. Different clothing, implements and many household alterations are needed. The character of labor is altered, particularly with farmers. A new class of demands are made upon the dwellers of cities and towns, and new employments given to their artisans. Thus life and activity are imparted to the circle of industry. This accounts for the greater comparative size and number of our cities, the home markets for our farms. If all our people were farmers, and made the simple clothes and furniture used elsewhere, there would be an abundance of food, but little wealth and activity. Some of the smaller countries of Europe gives us examples of this state of society. The census of New York shows that in 1875 not one-third of our population were engaged in raising food, and that more than two-thirds are consumers. This proves the importance of upholding our commercial interests, and of increasing the numbers of those who buy farm products.

At the South, where the great majority are tillers of the soil, although they have a monopoly of furnishing the world with cotton, yet their cities are small, their wants are few compared with ours, and their wealth is far less. Our seasons, our wants, our habits, will ever so multiply varied industries, that the farmers of the northern belt of States will have a larger proportion of home consumers, and

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of near-by markets in great cities, than can be found in any part of Europe in proportion to the number of those who till the soil.

Sir James Campbell, in his recent book about our country, speaks of the size of our cities as disproportionate to the number of our people. A comparison of the relative size of the towns on the continent of Europe and those of the United States makes this fact more striking. Although they have been so recently settled, their cities are outstripping those of other countries. The character of our climate explains this.

Strangers say that we are always in a hurry; so, too, is nature on this continent. It does its work quicker than elsewhere. When winter gives up its grasp upon the vegetable world it springs into life, unfolds its leaves, and yields its fruits in less time than is required in Europe. Our grain grows and ripens in a period at least one quarter less than in Great Britain. Indian corn at the West sends up great stalks eight or ten feet high and more than an inch in diameter, making food for cattle, and matures their abundant yield of grain for human use within four months from the time the farmer puts seed in the ground. The rapidity with which the products of our fields are ripened makes one of the necessities for the use of machinery. Grain must be gathered in quicker ways than those used in other countries. This fact has had much to do with the invention of methods more ready and effective than the sickle and scythe. Many of our crops would spoil in the fields if we relied upon labor as it is employed elsewhere.

Here nature not only hurries all its processes, but it is sharp and exacting in its changes. In the summer its heat gives us the plenty and indulgences of a semi-tropical climate. When, in a short time, it has perfected these for our use, it forces us to gather them in without delay, for it soon brings its frosts and arctic winters which drive us to meet new and varied wants, by other and varied industries. Our seasons do not slowly change, but they excite and stimulate us by marked contrasts of heat and cold, of green fields and of widespread deep coverings of snow and ice. Nature teaches and exacts activity of mind and body in our country.

A full statement would show that the extremes of heat and cold in the northern belt of States will ever be among the most important influences in stimulating the energies, the prosperity and the civilization of the American people.

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Conclusion.

Although we enjoy so many advantages, we must bear in mind that these will not of themselves give us prosperity. To gain this we must have intelligent and patient industry. I have no skill as a farmer, but I am a lover of country life, and I hold my neighbors in high regard. I study their ways, I learn their virtues, and I learn their faults. Did time permit, I would speak of their errors and of many serious mistakes which they make in the management of their affairs. I may do so on some other occasion. We have many things to learn and many methods to improve, before farming will become what it ought to be in this country.

To make clear the character of our continent, its fertility, extent and climate, strong terms have been used, which may seem to be exaggerations, calculated to mislead in some respects. The future will show their full influences. It is not probable we shall have, during the current year, such markets abroad as those which have given us wealth and business activity during the past six months. There is danger that these will be followed by a reaction in the prices of all kinds of property; that they have been carried above points at which they can be sustained. Prudent men will be cautious for a time, but the enduring facts set forth will govern in the end, and work out their results. We do not regard them in any spirit of ill-will or rivalry toward other countries. We hope and believe our prosperity will benefit all nations; that it will check abuses in Europe; teach monarchs that they must study the welfare of their subjects. The mingling of all European lineages on our soil will soften prejudices and lead the people of other countries to look more kindly upon their neighbors. We have been enriched by full harvests here and by their failure elsewhere. But these failures, while they may help us, are subjects for deep regrets. If in the season before us, all the fields of the world shall yield unusual abundance, we will rejoice and thank God for his bounties to our fellow-men in all quarters of the earth.

Note.—I am indebted to Dr. Homes, of the State Library, for a list of the cities of France, Germany, Austria and the United States. As the enumerations of their populations were made at different times, an exact comparison cannot be made of the number of their citizens. With regard to those in the United States, their growth is so much more rapid than that of towns elsewhere, that the census made this year will show that the number with more than 30,000 people should be much larger than I have stated in the following table:

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TABLE *showing the number of cities in the United States, France, Germany and Austria with populations of thirty thousand and upwards:*

Cities with a population of over	Census of 1870. United States.	Census of 1876. France.	Census of 1875. Germany.	Census of 1870. Austria.
1,000,000	One	One	One	
750,000	Two	One	One	One.
500,000	Five	One	One	One.
250,000	Eight	Three	One	One.
150,000	Thirteeen	Five	Four	Three.
100,000	Nineteen	Nine	Nine	Three.
75,000	Twenty-three	Eleven	Nineteen	Four.
50,000	Twenty-nine	Twenty-nine	Twenty-five	Ten.
30,000	Forty-five	Forty-one	Thirty-six	Fifteen.

With regard to those of the United States, the census of 1870 has been used, except in cases where later reports have been made.

In 1876, the population of France was..... 36,905,788
In 1875, that of Germany was..... 42,757,812
1869, that of Austria was about..... 36,000,000
That of the United States is now about..... 50,000,000

While our numbers are the largest, it must be borne in mind that our great cities, and most of those of a smaller size, are situated in the northern half of the Union, where the winters are very cold and the summers very hot; that they are supported by States whose united populations are not equal to those of the above-named European countries.

Great Britain is not brought into this statement, as no city can compare with London. Leaving that and New York out of view, our cities are larger and more numerous than those of the United Kingdom.

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THE LUNG PLAGUE—OUR DANGER AND THE REMEDY.

Address before the Society, January 21, 1880,
BY JAMES LAW, M. R. C. V. S.,
Professor of Veterinary Science in Cornell University, Consulting Veterinarian to the Society, and Chief Veterinary Officer of the State Cattle Commission.

MR. PRESIDENT AND GENTLEMEN. — The honored and eloquent gentleman who has presided over this Society for the past year has just depicted in glowing terms the mutual advantages to Europe and America of the abridging of the Atlantic voyage, of the liberal supply of our breadstuffs and meats to Europe, and of the constant accessions of the life's-blood of Europe, of its bone and sinew, to cultivate our waste lands and swell our harvests. We have been so charmed by the glowing tints that I fear it will prove a thankless task, as it is certainly an unpleasant one to call attention to a dark shade in the picture. While steam has bridged the ocean, brought Europe to our doors and conveyed our surplus products to the old world, multiplying our stores and scattering blessings broadcast on both continents, the outcome has not been an unmingled good, though the evil may be insignificant in proportion.

We have drawn upon the old world not only for our human population but for all our different classes of farm animals, and to-day all our domesticated cattle are but the descendants of imports from Europe. In this way we have obtained short-horns, Herefords, Ayrshires, Holsteins, polled Angus, Jerseys, Guernseys and Alderneys, whose descendants of to-day are not to be excelled on the face of the earth, but with these splendid imports we have introduced a less welcome accession in the most insidious and most dangerous of all the plagues of cattle — the Lung Plague.

If less desirable, this has not been less prolific than our other acquisitions from Europe. Landed in Brooklyn in 1843, in the body of a cow, from an English ship, this pestilence has multiplied its victims and conquered new territory, until six States have been darkened by its baleful shadow. From one, its victims have risen to hundreds and thousands. Year by year the area of its prevalence has extended, giving a guarantee, all too certain, that time alone is wanted

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to wrap the whole of this vast and productive continent in its deadly covering.

The European and North American continents, though so unlike in many respects, have this in common: that each has in its central area a vast extent of pasture land untilled and unfenced, covered by countless flocks and herds which roam at large and mingle freely day by day. In Europe and Asia these open pasture lands have from time immemorial been the permanent home of a number of animal plagues, which, once introduced, from whatever source, have spread from herd to herd and have become only more generally diffused from year to year. The continual accession of young and susceptible animals by birth has served to furnish a constant supply of raw material to work upon, and if at any time a herd has escaped infection for a time, or if a herd has been brought from outside for the improvement of the native stock, its members have been speedily contaminated by mingling with the infected cattle on the steppes, and have suffered all the more that they were now in greater part susceptible to the infection. On these great uninclosed plains, therefore, these plagues have defied all attempts of the individual and the government to extirpate them, and from these steppes western Europe has derived almost all her animal plagues. While the rinderpest stands at the head of the deadly list of steppe plagues, followed at no long distance by the Siberia Boil Plague, there prevail continually the more insidious but hardly less deadly lung plague, and the ruinous contagious eczema and sheep-pox.

Against these Germany and Austria can only protect themselves by rigidly guarding their frontiers, by a military patrol pacing every foot of ground day and night, and compelling all stock to undergo examination and quarantine. By a quarantine of a week the more rapid fevers (rinderpest, contagious eczema, foot and mouth disease, sheep-pox, etc.) are shut out, but the more insidious lung plague with its long period of incubation, and its equivocal chronic cases has continually escaped this vigilance and therefore while the rinderpest and sheep-pox have appeared in western Europe only at long intervals and almost altogether in connection with great wars which broke down the barriers, lung plague has prevailed without intermission. The magnitude of the trade was incompatible with a quarantine of ninety to one hundred days, and without such a quarantine the plague cannot be excluded.

The open grazing lands on the west of the Mississippi are the exact counterparts of the steppes of Europe and Asia, as far as regards the

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trade in cattle. They are the source of the traffic and from thence cattle are being constantly sent in thousands and tens of thousands to the middle and eastern States. Were a genuine plague to originate there, it would speedily spread through the whole unfenced territory, increasing its area with each succeeding year, but it would also pollute all the streams of the traffic and diffuse the deadly infection over all the middle and eastern States. The stock sent to supply the mining cities in the Rocky mountains would carry out the infection to Dakota, Wyoming, Utah and Nevada, and finally it would reach Washington, Oregon and California, and the whole Union would fall under the sway of the scourge.

Were such a plague to have but a short incubation of less than seven days, it might be possible, at great expense, to guard against it at the frontier of particular States; but even this would entail the accumulation at certain points (Buffalo, Chicago, etc.) of 20,000 head of cattle and upward at all times, seriously interfering with the trade, baffling all the calculations of the western shipper as to the probable markets, and rendering his occupation in the highest degree risky and uncertain. Were such a plague to bear the long incubation of the lung plague, the needful quarantine of ninety to one hundred days would be absolutely prohibitory, and either the trade must stop or the infection must spread over the entire East.

But Providence has endowed our western stock ranges with no such plague-generating fruitfulness. The soil, surpassingly rich in its vegetable products, has for ages supported vast herds of the bovine family (buffalo), but on no occasion has it produced the germ of any plague comparable to the European cattle plagues. Had this been once generated on these open plains, it would have been perpetuated as surely as it has been, under similar conditions, in Asia, Europe, Africa and Australia. The infection of the first two is too ancient to be matter of record, yet the plagues are as widespread to-day as they were before the dawn of history. The infection of South Africa and Australia is but a thing of yesterday (1854 and 1858, respectively), yet there, too, the infection continues to prevail and shows no sign of abatement.

We already harbor this the most insidious of all cattle plagues, and it is only a question of time or accident when it shall reach our open grazing lands. If it spreads only as it has spread in the past, by slow advances from farm to farm, it will be a number of years ere this is brought about. It is opposed by the great current of cattle traffic; and, were there no returning stream, we might for a time rest secure

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in the trust that our eastern seaboard and inclosed farms only would suffer. But with the rapid development of the cattle interests of the west the demand increases for better blood. The long-horned and bony Texans no longer adorn our markets, which are filled with the best of grades instead. To produce these, the eastern and European herds are depleted, and there is every reason to fear that a thoroughbred sire, sent out from New York, New Jersey, Pennsylvania, Maryland or Virginia, may carry out the infection to those western ranges, and secure its perpetuation and general diffusion over the continent.

The menace of this is constant, and becomes greater every day, as the plague becomes more widely extended.

While it was confined to the west end of Long Island, New York city and Jersey City, there was little risk of the passage of cattle from the infected regions to the West. The herds about those cities were simple dairy herds, composed of common stock, which were far cheaper in the West than where they were, and while these herds were being constantly maintained by new accessions from the West, they never furnished to the West any animal in return. But now that portions of six separate States are involved, the infected area incloses a great many valuable thoroughbred herds, which are constantly furnishing sires to improve the blood on the plains. As the infected area increases, the greater is the number of thoroughbred herds within this area, and the greater the likelihood of one such herd that has become infected furnishing a sire which shall carry the infection to our unfenced ranges. Many of our thoroughbred herds have been infected, and some now are. Blood gives no immunity. A short-horn cow carried this infection to Australia and infected the boundless pastures of that island continent. A Dutch bull conveyed it to the Cape of Good Hope, whence the whole of South Africa became infected. Four Holsteins infected the State of Massachusetts, and cost that commonwealth $78,000 and five years' work to root out the pestilence. Ayrshires infected Norway, Sweden, Denmark, Schleswig and Oldenburg. Almost all the non-European countries that have been infected have been so by thoroughbred stock. That thoroughbred stock has not already infected our western herds is little short of a miracle, and no folly can be worse than to count upon the indefinite continuance of this immunity. All our domesticated cattle are descendants of the imported stock of Europe, yet we escaped this plague until 1843. All the cattle of Australia are the progeny of imported cattle, yet they escaped the contagion until 1859. It is the one infected importation, after decades or centuries of harmless impor-

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tation, that fixes the scourge on a new land and blights its herds. The likelihood of the infection is increased in exact ratio with the great development of the live-stock industry in the West, the consequent demand for high-class sires, and the number of herds in the infected area at the East from which such sires can be drawn.

In the second place the danger of infection is increased in ratio with the infected area, because such area then contains a greater number of miles of rail, more railroad cars are used in conveying cattle, and cars used in this way are more likely to be used without disinfection for the conveyance of the thoroughbreds westward. This remark about cars applies with equal force to yards, loading banks and other places for the accommodation of cattle about to be shipped.

In the third place the increase of the infected area increases the danger that hay and other fodder that has been stored in the same barn with sick stock, and which on the death or sale of such stock has been thrown on the public market, shall be purchased and used for the thoroughbred cattle on their journey westward, thus conveying the infection to them and sending it out to the plains. Still more, the increase of the infected area renders it more probable that an attendant on sick cattle in the East thinking to better his condition may pack his trunk with the clothes saturated with contagion, may take a three days' journey out to the plains and there find employment about a herd, which may thus become infected and the starting point for the permanent infection of the continent. It is a matter of common occurrence with us that an infected building will convey the disease to new stock placed in it, after it has stood empty for weeks and months. If a stable will retain its poisons in an active form for three months, is it to be expected that clothes will become disinfected while packed in a close trunk for three days?

Other possible channels might be named, but these will suffice as illustrations. Every day increases the danger of our general infection, and therefore every day renders the demand more imperative that this old-world plague should be driven from our shores.

WORK IN NEW YORK IN 1879.

In the past year the Empire State has taken a laudable position on this matter. On February sixth I was summoned by a telegram from Governor Robinson to proceed to Kings and Queens and determine whether the contagious pleuro-pneumonia existed among the cattle of those counties, and if so to what extent. I arrived in

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New York on the seventh, examined a number of herds, and on the tenth reported the disease very prevalent in and around Brooklyn. General Patrick was at once appointed to take charge of the work, with myself as professional counsel and assistant. Measures were taken to circumscribe the infection and stamp it out, and as new developments showed that the disease had already gained a wider extension than at first appeared, our work was carried outward until we were finally dealing with it in the counties of New York, Kings, Queens, Suffolk, Richmond, Westchester, Putnam and Orange. Reports of outbreaks in more distant counties led to investigations in those of which I may specially name, Dutchess, Columbia, Rockland, Delaware, Oneida, Herkimer, Chenango and Tompkins, but in none of those counties was the lung plague found to exist. The complaints in all these cases were of another nature, though in a number of instances the lungs were diseased either from the presence of lung worms or of tubercles.

Not to weary you with a particular account of our work, I may say that the inspectors have examined 40,000 head of cattle, an amount of work which may be appreciated when I say that each had to be tested as regards pulse, breathing, temperature, and above all, by the percussion and auscultation of the chest. The need for great care and accuracy will be appreciated when I say that animals that have apparently recovered and that any stock-man would suppose to be perfectly sound, usually carry for months, or even for a year, encysted masses of dead lung, yet show scarcely any outward symptoms of this state of things; they milk well, and may even lay on flesh; the skin may become loose and supple, and yet those animals are often found to be the starting point of infection in a herd into which they may be brought. No such animal can be safely preserved and therefore the examination of each must be so thorough as to detect all such solid infecting masses, even where the general health appears excellent.

In carrying out our work we have had to kill and give indemnity for 521 head of cattle, we have held 220 herds under quarantine, we have eradicated the disease from three infected counties, and have all but accomplished the same for four more. There are still five infected places in New York city, six in Westchester, one in Putnam and a number in Queens, but only in the vicinity of Brooklyn.

In Brooklyn and suburbs we have at present thirty-five herds in quarantine aggregating 600 head of cattle, of which at least 100 head ought to have been slaughtered, but that we had no means of indemnifying the owners.

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With a sufficient appropriation we would be but a short time now in clearing all of New York, excepting Brooklyn and suburbs. Then if Brooklyn and the adjacent parts of Queens are put under the same rule with New York the work will be most effectively accomplished there as well. I need not try your patience by a full outline of the methods referred to. The primary points are the reception of stock from districts known to be sound, and from none others, in designated inspection yards; the movement of such stock, after examination and by permit, to the stables of the dairymen who buy them; the stoppage of all movement from any stable excepting to the slaughter-house, and that on permit, the cattle being inspected after death as well as before; the slaughter of all sick cattle and the thorough disinfection of the premises.

These measures, with many other minor ones, have been in force in New York city since July first, and had reduced the infection in that city to little over half a dozen herds by October first. We were not only delayed in Brooklyn for lack of means, but the Brooklyn aldermen opposed our work in various ways and to a serious extent. They passed an ordinance authorizing the pasturage of cows, as commoners, on unfenced lots, in direct violation of the orders of General Patrick acting for the governor. To prevent policemen and pound masters from enforcing the law, they next abolished the pounds. When delinquents were brought before police magistrates for violation of General Patrick's "pasturage order," the cases were dismissed and the police were sometimes censured. Alderman Powers went further and gave a permit to move cows in the city limits in defiance of the law.

In view of these facts it was impossible, with the means at our command, to secure a perfect control of the movement of cattle in Brooklyn, and as a liberal expenditure of money in that city would have produced very little good as compared with its outlay elsewhere, the work in Brooklyn since August first has been little more than the quarantining of herds and the regulation of the movement of cattle as far as circumstances would permit. The results in the two adjacent cities, about equally infected last spring, are highly instructive and encouraging. New York has now but five herds in quarantine and has furnished but five cases of lung plague in the past month. Brooklyn has thirty-five herds known to be infected, containing nearly one hundred animals that should have been slaughtered as affected with lung plague.

A few weeks will probably suffice to root out the disease from all

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our infected districts outside Brooklyn and its suburbs, and with sufficient means these too should be cleared by 1881.

Work for the Future.

But suppose this were accomplished, what is our prospect? Can we fold our hands and congratulate ourselves on our escape? Assuredly not. With New York as the great *entrepot* for cattle, not from the West alone, but from New Jersey, Pennsylvania and Maryland as well, the suspension of our vigilance for a single day would assuredly allow the reinfection of our herds, and if it were suspended for a week, it may be safely asserted that all our previous work and outlay would be undone.

1st. New York market has been so long closed against cows from the States south that the price is now higher in New York city and Long Island than in New Jersey and Eastern Pennsylvania. Every day we have applications to allow the introduction of cows and store cattle from New Jersey and Pennsylvania, and all sorts of influences are brought to bear to secure this end. Putnam and Westchester are equally in need of cows with New York, and if the restrictions were removed would be speedily filled up by unscrupulous dealers who would buy at a low figure out of the infected herds of New Jersey and scatter the purchases in the adjacent counties of New York. Some men of this stamp do not hesitate at means, and the moral obliquity which will allow them to purchase infected animals at a knacker's price and sell them for sound and fresh milch cows would also permit them to ship such animals to Fishkill and introduce them into Putnam and the counties south as western animals.

Even with our control of New York we have had much of this to contend with. Dealers from New Jersey have smuggled a few cows across from Jersey City in a boat load of fat steers, and in the unsatisfactory condition of Brooklyn have run them into the city and suburban dairies. We have detected several instances of this kind and quarantined the herds into which the smuggled cattle have been introduced. This thing cannot be done in New York city; nor could it be in Brooklyn if the same measures were once enforced there. But the traffic would be open and constant if our restrictions were removed, and the reinfection of our lower counties would be at once speedy and complete.

If, therefore, the work of extermination were to be accomplished in the State of New York to-morrow, it would still be requisite to maintain a staff of inspectors to guard against re-importation, and no

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less needful to restrict all movement in our lower counties to such animals as were accompanied by special permits, so long as the disease is harbored on the continent. If the individual States should refuse or fail to stamp out the plague, we can only be saved from a renewed invasion by the maintenance of such a constant watch, or by the United States stepping in and carrying out the work for the good of all.

2d. It has been decided by the United States Supreme Court in Missouri that any State law forbidding the introduction of cattle from a neighboring State on the ground of suspected infection is unconstitutional. Here is another barrier to the protection of one State against infection from its fellow. If we seek to protect our frontier against animals that bear the seeds of this pestilence we are at once barred by the law, and we must allow the pestilence bearers to enter our own territory and then deal with them as we think best. To keep infected animals out of the herds it will therefore become necessary for a State, acting for herself, to keep a constant watch on her whole frontier, and to maintain a great series of quarantine yards and a most expensive staff of officials if she would succeed. But the protection which cannot be procured by a State for herself can easily be accorded by a Federal authority which knows no State lines, and to whom the herds and dealers of all are alike known and alike amenable. This is a matter of inter-State commerce and as such rightly comes under the jurisdiction of the Federal power.

3d. Independently of the legal prohibition the limitation of the sanitary work to our State must render all control of inter-State cattle traffic either utterly useless or ruinously expensive. If the sanitary officers admit cattle from the neighboring States on a simple examination, they will inevitably admit many from infected herds and many in which the disease is still in the incubative stage, and that will show no signs of illness for two or three months to come. They will also fail to detect a certain number of those that carry in their chests the smaller masses of infecting material, and thus infection will be spread in spite of the great expense and trouble. If on the other hand they quarantine for three months all cattle crossing the frontier, the expense will be absolutely prohibitory, and smuggling will flourish as in all such cases.

For this again the action of the Federal authority is the most effective cure, for knowing no limits but thoseof the Union they will go to the infected herds everywhere and by promptly stamping out the pestilence will do away with all need for the complicated and costly

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machinery necessary to guard the border of each State, and will at the same time abolish smuggling by doing away with the contraband article, or so bonding it that it shall be held until it shall have furnished the requisite guarantees.

4th. With action by single States no guarantee can be given that cattle brought from a neighboring State have come out of a sound herd. But under Federal action and with a supervision for six months of the herd from which the stock has been drawn, the most perfect guarantee can be given and all need for expensive and prohibitory quarantine at the border will be done away with.

5th. If it is claimed that a proclamation by the president quarantining an infected State until it shall have stamped out this disease from its territory, and the enforcement of this quarantine by United States marshals aided by all good citizens, will sufficiently protect, I answer that the idea is delusive. Take the long frontier line between New York on the one hand and New Jersey and Pennsylvania on the other, and consider for a moment whether, with our constitution and habits, it is possible to maintain a sufficient watch day and night along such a frontier. To propose such a measure is to condemn it. A partial guard would be but a farce and would give but a fancied security without any real protection. In all such cases, there would soon be found persons in collusion on the two sides of the line, one of whom would purchase the cheap infected cattle and watch his opportunity to run them over to his partner in the next State, who would either offer them for sale on his own place, or run them off to a distance and dispose of them to parties who would be less liable to know the seller and come back to him with unpleasant criminations when months later the cattle began to sicken. All this would be obviated by having Federal officers dealing with the infected herds in all States alike.

6th. When official authority is bounded by the State, cattle run out of infected herds, or from which there is reason to fear infection, are free to be conveyed where the owner will the moment they have crossed the boundary, and the State officials who would gladly have detained them for the protection of their neighbor, are set at defiance and must look on helplessly. Somewhat of this nature were the escapades of the imported Holstein herd of Messrs. George Brown and Son, of Aurora, Illinois, and the herd of Mr. Culbertson of the same State, which, owing to some unexplained lapse at the Custom House, went to the West without detention or quarantine, and were

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immediately offered for sale, there being no authority in Illinois to impose any prohibition or restriction.

7th. Finally as regards importations the United States alone can impose a uniform and effective rule. Leave the matter to the different States, and we shall continue to find certain herds admitted like the Illinois cattle referred to, without any detention at all; others will be kept but eight days as were imports into Canada up to the time of our closing our frontier against Canadian stock; and still others, like the Jerseys at Philadelphia, will be released after a quarantine of thirty days. A system, by the action of which we find examples like these alongside of the three months' quarantine imposed in New York, is eminently unequal and unjust, and must sooner or later come to an end through the indignant remonstrances of the sufferers.

But I have said enough. If I have not already convinced you of the necessity for a uniform and common action in all the States, I despair of doing so by anything further that I can say. This plague, foreign to our soil, may be compared most aptly to an enemy who has landed on our shores, and who aims to lay the whole country under contribution and to reduce it to subjection. This enemy knows no State limits, and respects no border lines. He seizes on the points of vantage, fortifies them strongly, and, disarming the populace and spoiling them of the fruits of their labors for the support of his soldiery, he makes every new accession but an additional arm of strength by which he may reach forward to subjugate the territory beyond. What would be thought of the counsel that would advocate that the opposition to such an invasion should be circumscribed by State limits? That we might, if we chose, drive the enemy from New York, but we must not follow him into New Jersey or Connecticut. That if Delaware and Virginia chose to submit to the invader, and give him a stronghold whence he could raid, plunder and subjugate the States adjacent, we must each bide our time, let each State protect its own interests, and let none interfere with the common enemy until he has entered the territory of that particular State. Yet the plague is no less dangerous and relentless; no less oblivious of political boundaries; no less inimical to the whole nation; no less tenacious in its grasp upon new territory, and must be no less disastrous to our finances when it shall have conquered the country, and when we shall see scores of millions annually forcibly taken from the hard-earned gains of our people. Of the two the plague is incomparably the more dangerous, as it lurks in

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each new region for months unseen and unsuspected, and while an invading army can only hope to subjugate a free and loyal people by moving in overwhelming masses, the plague may blight our whole cattle industry if but one infected beast, in the guise of a sound and most desirable sire, is transported to the far West.

If we are ever to be permanently freed from this pestilence we must secure a concerted uniformity of action, and such action can only be had through the intervention of the Federal Government. The first requisite is that the needful outlay must be met by the national exchequer. This is the least that can be asked, as the plague is a far greater menace to the vast grazing regions of the South and West than it is to the comparatively restricted infected area in the East.

This measure alone may be sufficient to secure a prompt and effective action in each infected State, and it would only be requisite to have a Federal Sanitary Commission to oversee the work, to audit the bills and to authorize payment only when the work was properly conceived and efficiently carried out, and we might soon hope to see the last of the pestilence. But in view of the apathy of certain States any bill providing for this should have a clause enacting that when a State declined to take action, or to make such action efficient, it should become the duty of the United States Government to step in and do the work for the general weal.

This is not a subject that we can afford to deal with leisurely. It must furnish no sinecures, nor set of permanent offices to be maintained year after year for the support of favorites. The work must be active that relief may come early, and any partial or ineffectual measures must be speedily superseded by others more stringent and effective. It is a great work that may cost the nation $1,000,000 or $2.000,000, but the outlay will be fully warranted in the warding off of a pestilence, which if left to itself may cost the country a thousand millions before the end of the present century.

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REPORT ON SOME INJURIOUS INSECTS OF THE YEAR 1879.

Presented to the New York State Agricultural Society,
BY J. A. LINTNER,
At the Annual Meeting, January 21, 1880.

Recognizing, as I do, the great importance of the study of insects as a means of mental discipline to the young, as an unfailing and ever-present source of interest and instruction in more advanced years, as a duty resting upon every one to acquaint himself with the common objects with which he is surrounded, and, lastly, the incalculable economic value of the study of the myriad forms which almost seem to hold a place in nature antagonistic to us in our struggles for existence — I take pleasure in being able to report marked progress in entomological studies during the past year. If, gentlemen of the New York State Agricultural Society, you who are more directly exposed to the pecuniary losses resulting from insect depredations, may perchance feel that your interests have not secured their proper consideration in these studies, I beg leave to remind you, that before the study of economic entomology can be properly and most advantageously prosecuted, much preliminary work remains to be done. The material must be sought for, collected and placed in proper hands. Careful study of allied forms, which may have been described in this country or in Europe, must be made. The hosts of previously unknown forms are to be described, and respectively assigned to their proper places in systematic arrangement.

In Europe — as the result of a more general attention to natural history, the broad recognition of its value, and the liberal aid extended to this department of study through private munificence as well as government patronage — much of this preliminary work has already been accomplished. The discovery of a new insect is comparatively rare. Nearly all the known insects have been described, and pictured, in accurate figures and faithful coloring, in all their stages, when the same are known, even of those microscopic but surpassingly beautiful Tineid moths, whose entire development, from the egg to the perfect insect, is perfected within the circumscribed limits of the inner tissue

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of a single tiny leaf. As the direct consequence of this knowledge of insect forms — of descriptive entomology, as it is termed — general entomology in Europe is quite in advance of its stage of advancement in this country. In all the principal continental universities it has prominent place in the scientific course of study, under charge of eminent professors, occupying liberally endowed chairs. The students have access to collections, the extent and value of which dwarf those of our institutions. Years ago a single collection of Coleoptera (beetles), in Munich, could boast of its 25,000 named species; and no longer ago than the date of this enumeration, when, as it may be inferred, considerably less was known of insects than at the present, one of our writers, in a volume purporting to impart instruction in natural history, gravely informed his readers that "there are two kinds of beetles, a black one and a red one." In contrast with such ignorance, it may be stated that our last list of North American coleoptera, published six years ago, gave the names of 7,450 species.

It is very encouraging that so much attention is now being given to insects in our country — quite as much, it is believed, as to any other department of natural history. The number of those engaged in the study is rapidly increasing. At the last meeting of the American Association for the Advancement of Science, a list was reported, to our great surprise, of 835 persons in the United States and Dominion of Canada who are engaged in entomological work. A most gratifying demand is springing up for works treating of insects, for private study, and for instruction in our institutions of learning. The several serial publications exclusively devoted to entomology are well sustained. The Smithsonian Institution at Washington, in pursuance of the expressed objects of its organization — the extension and diffusion of knowledge among men — is continuing its series of entomological volumes, and has during the past year given us a catalogue of the Diptera (flies) of North America, embracing about 2,500 species, which has been years in preparation; and, as illustrating the greater progress which our European friends have made in their studies, to which I have above referred, I may state that, for the more satisfactory completion of the work, the author, Baron Osten-Sacken, found it desirable, for the last three years, to take up his abode among the collections and books and scientists of Heidelberg, in Germany. And, last to which I will refer, the United States Entomological Commission, established by our general government for the special investigation of the Rocky Mountain locust, is still continued, having had the sphere of its operations extended to include other of our more

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injurious insects. It is now in the third year of its active operations, and, notwithstanding the valuable results which have been already secured by its labors, the vast field opening before it seems scarcely to have been entered upon.

Did time permit, I would invite your attention to a statement of the probable work in descriptive entomology yet to be done throughout our broad extent of territory, before we are prepared to present even an approximate enumeration of the insect forms with which we have to contend, and whose transformations and varied habits it is the province of the practical entomologist to study and to record. But the brief time allotted to me will scarce suffice to invite your attention to a few of the interesting insect depredators to which my attention has been called during the past year.

THE CLOVER-SEED MIDGE — *Cecidomyia leguminicola* (Lintn.).

In the paper which I presented to your society at its last annual meeting, I described and gave some account of a new insect-pest, under the name of *Cecidomyia trifolii*, which was injuring to a great extent the clover-seed crop, in some of the western counties of our State. A description of the larval form of the insect, under the above name, was published in the *Canadian Entomologist*, for March, 1879. Soon after the above publication, I learned that the name which I had selected had already been used in Europe, by Franz Loew (*Verhandl. Zool. Bot. Gesell.*, Wien, 1874, vol. xxiv, p. 142), for a species which he had discovered within a leaf of *Trifolium pratense*. Accompanying the description of the larva, pupa and perfect form, is a figure of the deformation of the plant. In addition to this, two other species of Cecidomyia possibly have been detected in Europe. Bremi, in his *Monograph of the Cecidomyia*, states that in a locality where he had found *Cecidomyia ranunculi* on *Ranunculus bulbosus*, he also observed on the leaves of the red clover, *Trifolium pratense*, small cornucopiæ similar to those on the Ranunculus, but less regular, as in some of the leaves only the tip was rolled, while other leaves were folded like a pod. He believed them to be only a varietal mode of occurrence of the *Cecidomyia ranunculi*, but was not able to obtain the perfect insect.

The other form is noticed by Perris, in *Ann. Soc. Entomolog. France*, 1870, p. 179, where he mentions the occurrence of Cecidomyous larvæ in the tips (*extremes tiges*) of *Trifolium subterraneum*, of which the imago was unknown to him. Franz Loew, in a subsequent notice of these larvæ (*Wein Z. B. Gesell.*, 1876, p. 92) sug-

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gests that they may have been only inquilines, and that the deformation described by Perris may have resulted from the operations of Acari.

It will be seen from the above that the species of Cecidomyia which are known to infest the clover in Europe are of the kind which produce deformation in the plant, and consequently are quite different in their operations and habits from our species, which attacks the forming seed and prevents its development.

In consequence of the pre-occupation, as above stated, of the specific name at first given, I proposed in a paper published in the *Canadian Entomologist* for July, 1879, the name of *Cecidomyia leguminicola* for the species, the larva of which lives within the clover legume.

When this insect was brought to your notice a year ago, the larva only was known to me. I then stated that from some larvæ which had emerged from clover heads and entered the earth for pupation, I hoped shortly to obtain examples of the perfect insect. Anticipating possible failure in carrying them safely through their pupation (which proved to be the result) I made application to a member of the society, Mr. R. J. Swan, of Geneva, N. Y., who at the annual meeting had mentioned the occurrence, in very large numbers, of the larvæ in a clover field upon his farm, asking that some of the surface soil from the field might be forwarded to me.

In compliance with my request, a small box of the earth and clover roots (of about six inches cube) was sent and received by me on the second of June. The contents of the box were spread out in a glass covered case, and on the following morning, a pair of the minute but beautiful little creatures when examined with a lens, were found, in copula, in the case. Additional examples — twenty-five in all — continued to emerge, until the twenty-seventh of June. Had the earth been procured at an earlier date, many more specimens might have been obtained, and it would have been an interesting result, toward a knowledge of the abundance of the insect, to have ascertained how many individuals would have been given out from a square foot of earth.

The earliest date of the appearance of the midge is not definitely known. The mature larvæ which I have taken from the heads of clover early in June must have been the progeny of insects abroad as early as the first of May. It is probable that the eggs are deposited as soon as the blossom has sufficiently advanced to offer a proper place for their reception. The statement made by Prof. Riley, that

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the flies begin to emerge in the month of September,* would indicate two annual broods, as is the case with the Hessian fly† (*Cecidomyia destructor*) and perhaps with the wheat-midge (*Diplosis tritici.*)

Simultaneously with my observations on this insect, Prof. Riley, of the United States Entomological Commission, was engaged in its study, as I subsequently learned — his attention having been drawn to its presence in Western New York, in August of 1878. A communication in relation to it, with enlarged figures of the insect, was given by him in the *American Agriculturist* for July, 1879. In advance copies of the *Report of the Entomologist* (published August 22, 1879), extracted from the *Annual Report of the Department of Agriculture*, for the year 1878, the figures are reproduced, and descriptions of the insect in its several stages, given. No important facts in regard to its habits are communicated.

Soon after my publication of the discovery of this insect, Prof. W. H. Brewer, of Yale College, Conn., gave me the information that his father, Mr. Henry Brewer, of Enfield Center, Tompkins Co., N. Y., had been an enthusiastic grower of clover and clover seed as far back as he could remember, and that many years ago, certainly before 1848, it had been known to him that an insect attacked the clover, which hatched out a fly, of small size and slender form — all that could be recalled of it. The clover heads were not affected externally, in their appearance, by the insect. It was believed, at the time, that the depredating larva existed within the seed. On two occasions, once before 1848, and later, between 1851 and 1855, Prof. Brewer hatched out flies and sent them to Albany, either to the Entomologist or the *Country Gentleman*, but nothing was learned from them.

From the above statement, I was led to believe, and somewhat hastily published my belief (*Canadian Entomologist*, vol. xi. p. 124) that there could be but little doubt that the above insect was identical with the newly described clover-midge, and that it was quite an interesting fact that the first notice of the species, so far as known, came from a county (Tompkins) which was suffering more from its depredations at the present time, than any other portion of the State.

Additional correspondence with Prof. Brewer has shown me that the insect pest of clover seed of thirty years ago could not have been

* Report of the Commissioner of Agriculture for the year 1878, p. 251.

† Dr. Packard suggests the possibility of a third brood in New York.

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our present clover midge. He makes the following statement: "When the ripened heads of clover, after having been cut for seed, were rubbed in the hand to separate the chaff (calyx) from the seeds, some seeds would be found which were not so plump as others — of a more brownish color, and lacking the lustre of the normal seed. A needle could be thrust through them, disclosing, as we thought, a very small worm within. On one or two occasions, when such seeds or clover heads, believed to be invested, were kept in a vial with gauze tied over the top, the minute flies appeared after a time."

Mr. Henry Brewer is quite positive of the difference of the two insects — the one of years ago feeding upon the mature seed, and the recent one, preventing the formation. The operations of the latter were first noticed by him six or seven years ago [1872 or 1873]. He represents it as a great pest, nearly destroying the crop, and further states that the "little kind" of clover is more affected than the "large kind" [varietal distinctions which have long prevailed in that portion of the State]. What the insect preying upon the mature seed could have been, we are at a loss to know. It probably failed to receive scientific study, and having had its cycle, may have passed away, perhaps to reappear at no distant day. Possibly the larvæ may have been those of some specie of Coleoptera (beetles), and the "small flies" observed in the bottles, hymenopterous parasites preying upon them, and eventually exterminating them.

While the only serious injuries reported of this insect are from the western portion of the State of New York, it is, in all probability, quite generally distributed throughout the State, and extends, at least, to adjoining States. On the 1st of July of last year (1879), examples of the larvæ were found by me in clover heads gathered on Mt. Equinox, Vermont, at an elevation of 2,500 feet above tide. On July fifth, a late period for a first brood of larvæ, mature specimens were taken from heads of *Trifolium pratense* growing within the city of Albany, bordering the sidewalk of Western Avenue. A large number of the heads of white clover (*Trifolium repens*) gathered at the time, gave me no larvæ, nor indications of their depredations. My knowledge of the capture of the midge, at large, is limited to a single instance, where an example was picked up from the deck of a steamboat on the Hudson river, near Castleton, N. Y., on the sixteenth of July.

As showing the serious aspect which the operations of this insect

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is assuming, I quote, by permission, from a report presented the present month to the secretary of the State Agricultural Society by Mr. Wm. W. Stacey, president of the Seneca County Agricultural Society. He writes: "The crop of clover seed in our county is an entire failure, owing to the ravages of an insect very similar to the wheat-fly so destructive to that grain in this section some years ago, and which attacks the head, feeding on the juices of the green seed. This insect has been noticed in the clover for some few years past to some slight extent, varying in localities, but this year, has developed to an alarming degree all through this and the adjoining counties."

The clover-seed midge, in general form and external character, resembles the wheat-midge, *Diplosis tritici*, but it is readily distinguished from it by its color — its wings being dusky from their pubescent covering of short, curved, blackish hairs, its abdomen red and marked on each ring with some black scales arranged in a segment of a circle arched in front, its thorax superiorly and head red, and its legs brown. The wheat-midge is of a pale yellow or orange-yellow color, the size of the female is twice that of the clover-seed midge, and its male is proportionately smaller than that of the latter, in which the difference in size of the sexes is not very marked.

THE CLOVER-ROOT BORER — *Hylesinus trifolii* Müll.

Another serious insect pest of the red clover has been brought to notice during the past year. The attention of Prof. Riley was first called to the ravages of this insect in the fall of 1878, in some clover fields in Branchport, Yates county, N. Y. Upon visiting the locality, he found the roots of the clover so infested by the insect, and destroyed to so great an extent as to prevent the cutting — the plant pulling out and gathering in windrows before the mower. In the infested fields, not a single plant entirely free from the insect could be found. The roots in many instances had been completely severed from the stem, and the stems were often found to have been bored for some distance above the ground.

The insect proved to be a small beetle, belonging to the destructive family of Scolytidæ, which comprises some of the most formidable enemies of arboriculture both here and in Europe, as the species of Scolytus, Tomicus, Hylastes, etc. It was identified by Prof. Riley as *Hylesinus trifolii* Mull — a European species described by Müller in 1844. Its injuries to *Trifolium pratense* in Europe, and especially in Germany, had long been known, where they were of the same nature as those observed in Western New York. In all probability

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it had recently been introduced in this country, for it was not known to Dr. Le Conte at the time of the publication of his *Synopsis of the Scolytidæ*,* in 1868, in which he records ten other species of the genus Hylesinus from various parts of the United States, nor is it included in the Crotch *Check List of Coleoptera*, published in 1874.

The operations of the insect, as described by Prof. Riley, are as follows: The beetles emerge from the ground in early spring, and pair. The female eats a cavity into the crown of the root, in which she deposits about a half-dozen eggs. The larvæ hatch in about a week and burrow downward, extending their channels into the branches of the root. Having attained their growth, they transform to pupæ in an enlarged cavity made for the purpose at the end of the burrow, during the latter part of September and through October. With the first frosts nearly all have changed to the imago or perfect stage, although it is stated that delayed specimens were to be found passing their period of hybernation in both the larval and pupal forms.

The appearance of this insect, as larva, pupa and beetle, is shown in *b*, *c*, and *d*, in enlarged views, from drawings by Riley. The operation of the larva within the roots and stem are represented at *a*, *a*, *a*. The beetle, like many of our more destructive insects and most difficult to control, is quite small, measuring less than one-tenth of an inch in length (.08 inch). It is elongate-ovate in form, of a reddish-brown color; head nearly concealed; thorax pubescent, large, and almost as broad as long; wing-covers striated and closely punctured in the interstices. The larva is described as of the normal form and character of the Scolytidæ, of a dingy-white color, with a honey-yellow head and brown mouth-parts.

Mr. W. W. Stacey, of Seneca county, from whom I have before quoted, expresses the alarm which the appearance, in such force, of this insect is exciting in his portion of the State. He writes: "In addition to the clover-fly, which cuts off an important source of income to our farmers from clover seed, appears another insect which attacks the clover plant itself, developing into a grub or insect which

* *Trans. Amer. Entomolog. Soc.*, vol. ii, pp. 150–178. 1868–69.

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eats into the heart of the root, thus killing the plant. Our farmers justly regard this as the greatest evil that has yet befallen them, for clover is the sheet anchor of our husbandry, and anything that tends to destroy its cultivation, strikes a blow at the best system of rotation which we have yet found and destroys the cheapest and best fertilizer known for our clay loams."

The Wheat-stem Maggot — *Meromyza Americana* Fitch.

Some stalks of spring wheat, from a field in Scipioville, Cayuga county, N. Y., were submitted to my examination, about the first of August, which were seriously affected by some insect depredator, thought by the sender to be the "southern joint-worm."

An examination of the specimens sent revealed the ravages of a quite formidable depredator on the wheat, broadly distributed throughout the country, although thus far it has attracted very little attention. It does not appear to be known to our agriculturists, and has only, we believe, engaged the study of two of our entomological authors.

The heads were entirely destitute of kernels. Within some of the husks, the remains of the blossoms were discoverable, showing that their development had been arrested before the formation of the grain. Upon removing the investing sheath, the stem was found to be discolored and shrunken, and quite dry for three or four inches above the joint; and near the joint it was so eaten and shriveled as to be utterly useless for the purpose of conveying the sap. Immediately above the joint, and surrounded by the remains of the stem, larvæ were discovered, a single one in each stem, of a watery-green color, elongate, quite tapering toward the terminal end, and sub-cylindrical at the other, and of a length of about one-fourth of an inch. In some of the stems larvæ had assumed the pupal stage, not very unlike the larvæ in general appearance, but showing the wing-cases, a more acute form at its head, and more rounded at its anal extremity. The pupæ were also imbedded within the remains of the stem, at about the distance of an inch from the joint.

While examining the stems the day following their reception by me, on August fifth, two of the mature flies were discovered quietly moving over my table. They had probably emerged en route, and had escaped unnoticed by me from the box in which the plants had been sent. Although Dr. Fitch mentions the occurrence of this fly in wheat fields during the latter part of June, it appears that the first week in August is within its period of apparition in the State of New

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York, and, as indicated by the larvæ still unchanged at this time, the flies will continue to emerge throughout the month of August, and perhaps into September.

The insect, in its perfect state, is a fly not unlike our common house-fly (*Musca domestica*) in general shape, but of a more slender form, smaller and more delicately colored, and more conspicuously marked. It belongs to the family of Oscinidæ, which embraces several genera, and quite a large number of American species, of which by far the larger proportion have been described by Dr. Loew. This species was first described by Dr. Fitch, in the year 1854, in his second report on the insects of New York (First and Second Report, p. 299, 1856), under the name of *Meromyza Americana*. The description given is as follows: "It is 0.17 inch in length to the tip of its abdomen, and 0.20 inch to the end of its wings. It is yellowish-white, with a black spot on the top of its head, which is continued back to the pedicel of the neck. Thorax with three broad black stripes, approaching each other anteriorly, but not coming in contact, the middle stripe prolonged anteriorly to the middle of the neck, and posteriorly to the apex of the scutel. Abdomen with three broad, blackish stripes, which are confluent posteriorly, and interrupted at each of the sutures. Tips of the feet and veins of the hyaline wings blackish. Eyes bright green. Antennæ dusky on their upper side."

No account of the habits and transformations of the insect is given by Dr. Fitch, as they were unknown to him, as the flies had merely been taken by him by sweeping with a net over growing wheat. Its transformations were first observed by Prof. Riley, and published by him in the *Rural New Yorker* for January 28, 1869. In his *First Report on the Insects of Missouri*, 1869, its transformations are also described, the larval depredations narrated, and the larval, pupal and perfect stages figured (pp. 159, 160, pl. 2, fig. 28). Mr. Townend Glover, for many years, and until recently, the Entomologist of the Department of Agriculture, at Washington, in his *Manuscript Notes from My Journal — Diptera*, mentions the species, and states: "The larva lives in the stem of the wheat, and injures it by gnawing the stalk from within, and by devouring the substance immediately above the upper joint." (His figure 32, of plate ix, represents the insect, and not figure 33, as stated.) It does not appear from the above brief mention, that it had come under the personal notice of the writer. Baron Osten Sacken has recorded the species in the two editions of his *Catalogue of the Diptera of North America* (pp. 83, 207: 1858, 1878), as the only known member of the genus, placing it between

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the well-known genera Oscinis and Chlorops. The species is also noticed in Hind's *Insects and Diseases Injurious to the Wheat Crops* [of Canada], Toronto, 1857, (p. 104), but the description is evidently borrowed from Dr. Fitch, and there is no evidence of its having been identified among the Canadian insects. The literature of the species, so far as we can discover, is limited to the above.

Prof. Riley noticed its operations about the middle of June, 1867, in all the wheat fields examined by him between St. Louis and seventy miles westward, to Bluffton on the Missouri river. From one to four per cent of the heads of wheat in these fields had turned yellow and apparently prematurely ripened, and on close inspection were found to be stunted and shorter than the rest, and with their kernels withered and shrunken. The last or ear-bearing joint could be easily drawn out of its sheath in a yellow and dried condition, with its lower end irregularly gnawed. The larvæ causing the injury were discovered very near the joint (within one-fourth of an inch). Specimens of the infested stalk were collected, within which the pupal state was soon assumed, and perfect insects emerged during the first week in July, after a pupation of from twelve to fourteen days.

From the above notice to the present, we have no positive information of its depredations, but there is every reason to believe that they have been meanwhile continued, while inexcusably attributed to other of the well-known wheat insects, as the joint-worm, Hessian fly and the wheat-midge by those who should have made themselves acquainted with the very different modes of operation from which their injuries result. It is somewhat singular that investigations were not continued upon an insect of so great economic importance and that there has not yet been given to us its complete history, commencing with the deposition of the egg.

The occurrence of this insect in Medina county, Ohio, is, in all probability, indicated by an inquiry made by a correspondent of the *Country Gentleman* (issue of July 27, 1876), from Hinckley, Ohio, for information of the insect which is injuring his spring wheat — a small white worm above the joint nearest the head, causing the head to die before it fills.

In Europe, several of the species of Oscinis and Chlorops, which are closely allied to the Meromyza, are known to be injurious to the wheat, rye and barley, and one of them, the *Oscinis vastator* Curtis, is reported as having the same habit with our *M. Americana*, the larva living near the base of the stem and eating out the plume of wheat, barley, etc., "thus destroying the future ear." *Oscinis frit*

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Linn., occupies the husks of the barley, injuring the crop in Sweden annually, as calculated by Linnæus a century ago, to the amount of half a million of dollars. *Oscinis granarius* Curtis, lives in the stems of wheat, but its excessive ravages are restrained by numerous Pteromalus parasites. *Oscinis pumilionis* occurs "in the lower part of stems of wheat, rye and barley, causing the plants to become stunted in growth." Other allied species (*O. tæniopus* Meig., and others) are said to cause a swelling in the stems of wheat and barley, known in England as the "*Gout.*"

The great need of the study of our injurious insects is shown in our almost entire ignorance of the habits and transformations of the destructive flies which comprise the family of Oscinidæ. Mr. Glover, in his report for the year 1872 (p. 134), writes: "It is singular that we hear no particular or decided complaints from our own farmers of any insects in the stalks of wheat, excepting the well-known joint-worm, which is a hymenopterous insect, and has four wings instead of two. We have several species of Chlorops in this country, the flies of which are extremely abundant among the plants in grain fields, and, no doubt, do attack our grain in the same manner as the European species, but as yet they have not done sufficient damage to attract the attention of the agriculturist."

Dr. Fitch, in his notice of the wheat and barley flies of the genera Chlorops and Oscinis and others (First and Second Reports, pp. 297, 298, 300), records and comments upon their abundance: "I have the present season discovered these small flies in abundance, in every wheat field in my neighborhood. On sweeping with a net anywhere among growing wheat, a multitude of them will be gathered. They are of several different kinds. * * * One of these species [*Sapromyza* (*Chlorops*) *vulgaris*] was so abundant the latter part of June, that at almost every step in any of our wheat fields, a dozen or more of them could be seen. * * * I doubt not it is from the number of these and other insect depredators which abound upon our wheat, that we are no longer able to produce such crops of this grain as were uniformly harvested formerly, when our lands were newly cleared. How is it possible for wheat to grow with any thriftiness when it is incessantly assailed by such hosts of these enemies, bleeding it at every pore?"

Of the above flies, Dr. Fitch names and describes *Siphonella obesa*, *Chlorops vulgaris*, *C. antennalis*, *Oscinis tibialis*, *O. coxendix*, *O. crassifemoris*, *Hylemyia deceptiva*, *Hylemyia similis and Agromyza triciti* (loc. cit., pp. 299–303) — all found upon wheat in wheat fields,

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except the latter, which was reared from larvæ crawling in immense numbers from unthreshed wheat in a barn. Of the other eight species, nothing has been published of their depredations, habits or transformations, but we shall probably not err in accepting them as serious pests which are annually levying no inconsiderable tax upon our wheat crops.

Now that the *Meromyza Americana* has been discovered in a formidable attack upon the wheat crop in our State, and the method of its injury disclosed, we shall doubtless soon have occasion to make frequent reference to it. For the convenience of ready reference, a common name is desirable, which may easily be recalled by those not versed in entomological science: and as the larva is among the largest of the wheat-infesting Oscinidæ, it may with propriety be called the *wheat-stem maggot.** The distinctive name may not be agreeable to ears polite, yet it will have the merit of defining the order of insects to which it pertains, and names in popular use should at least convey no erroneous teaching. The "joint-worm," the "currant-worm," the "meal-worm," etc., all belong to a different class of the animal kingdom from the worms; the "grain-weevil" is not a weevil, the latter being a beetle and the former a fly; and the "carpet-bug" is a beetle, and not a member of the order of bugs (Hemiptera). The name of "maggot" indicates the larval state of a fly, and should be allowed no further latitude; a grub is understood to be the larva of a beetle, and a caterpillar the larva of a butterfly or moth.

In the event of an increase of the wheat-stem maggot to a serious extent, we regret to have to state, that in all probability very little can be done to control its ravages, and our main dependance will have to be on parasitic aid. Measures which can advantageously be employed in controlling other of our wheat pests, as turning over the soil or burning the stubble, would be of no avail with this insect. Its pupation and transformation to the perfect insect takes place, as previously related, *within the plant*, and it emerges before the grain is harvested. In some of the countries of Europe, where the ravages of the Oscinidæ are excessive, whenever they become extremely abundant, relief is found in a resort to the culture of other crops for a few years.

THE CORN CURCULIO — *Sphenophorus zeæ* Walsh.

During the latter part of June a number of snout-beetles, or weevils, belonging to the Curculionidæ were sent to me from Bordentown,

* An allied European species, *Chlorops pumilionis*, is known as the wheat-stem fly.

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New Jersey, with the statement that they were proving a serious annoyance to corn fields in that vicinity Their operations were secretly conducted, below the surface of the ground. Upon removing some of the earth from around the young shoots which were wilting and dying, from three to five of the beetles would be found as the cause of the destruction, clinging to the shoots, which they had punctured with their beaks and from which they were extracting the juices. They were proving a greater evil than the common cut-worms, as they continued their ravages later, even until after the middle of June.

The beetles, upon examination, were found to be the species described by Mr. Walsh in the Practical Entomologist, in 1867, as *Sphenophorous zeæ* from examples which he had received from Tioga county, N. Y., where, it was stated, they had pierced with their slender snouts or beaks numerous small holes in the young stalks of corn near the ground. The sap which exuded from these punctures attracted numbers of ants to feed upon it, and they were at first believed to be the authors of the injuries, but later the beetles were discovered making the punctures. In the same year reports were received that several fields of corn near the Susquehanna river had been nearly ruined by the same insect.

Prof. Riley, in his *Third Report on the Insects of Missouri*, 1871, (p. 59), states that in 1868 he had received numerous specimens of the beetle from Geneva, Ontario county, N. Y., and also that he had found it in great numbers on the lake beach at Chicago. He believes it to breed in moist and decaying wood, as it and other species of the genus have been found under such conditions, and in decayed logs floating in swamps.

Examples identical with those received from New Jersey are in the collection of the New York State Agricultural Society, placed therein and labeled by Dr. Fitch, probably about fifteen years ago, as "*Sphenophorus venata* — the hunter weevil." No reference to the species, however, is to be found in his reports, and it is probably an erroneous identification with the *S. venatus* of Say, which Dr. Horn, as I am informed by Dr. Le Conte, regards as a synonym of *S. placidus*, together with *S. rectus* and *S. immunis* — all of Say. Mr. Walsh entertained some doubt of specific difference between the form named by him as *S. zeæ* and the *S. truncatus* of Say, but Dr. Horn, who has given critical study to this genus, believes it to be a distinct species.

Mr. Glover, in his *Report of the Entomologist*, contained in the *Report of the Commissioner of Agriculture for the year* 1870, makes mention (on p. 68) of a black curculio with curiously sculptured

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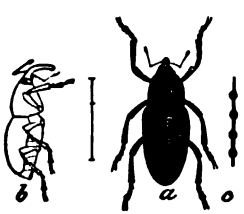
thorax, *Sphenophorus cariosus* Oliv., which had been received from New Jersey, where it was said to be destructive to young corn in the field by piercing the stems, *in which the larva lived and fed.* The accuracy of the statement relating to the larva may be questioned. Mr. Glover also states that another Sphenophorus had been sent several years previously from South Carolina, under the local name of *bill-bug*, which had been very destructive to growing maize in the low lands of the Pedee, where the plants attacked turned yellow, and many died.

Dr. Packard also notices this insect in Hayden's *Ninth Annual Report of the U. S. Geolog.-Geograph. Surv. Terr.* for 1875, quoting from Mr. Walsh and other writers.

The species of this genus are quite numerous, forty-one North American species being recorded in the Crotch Check-List.

Although the *S. zeæ* is not generally regarded as injurious, and may not occur in any great abundance over a wide extent of territory, yet, as it has an extensive distribution throughout the United States, extending from the Atlantic to the Mississippi, it is not improbable that it may be the unsuspected cause of much of the injury to young corn which is charged to cut-worms and other pests. When, therefore, the young shoots are seen to be injured from some not apparent cause, search should be made for the beetle beneath the ground, where, if present, it will probably be found near to, or with its beak inserted in, the plant.



The accompanying figures of the insect, together with the following description (mainly from Walsh), will enable the beetle to be recognized: Length of body, about three-tenths of an inch; snout, one-tenth, quite curved, of the thickness of a stout horse-hair: color, black or brownish-black; head finely punctured toward the base, with a large dilated puncture between the eyes above; before the middle of the subtriangular thorax is a smooth diamond-shaped spot; on each side of this, another smooth spot of irregular shape; the other portions of the thorax are covered with large punctures; body suboval (as at *a*, and in side view at *b*); wing-cases with rows of larger punctures, placed wide apart on the grooves (represented in enlargement at *c*); a small, elongate-oval smooth spot on the shoulder, and another near the tip of the wing case; beneath, polished, and with punctures as large as those of the thorax.

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The Stalk-Borer — *Gortyna nitela* Guen.

An insect which has rarely, if ever, been known to exist in such numbers as to commit serious depredations, and which, by its comparative rarity and the nature of its food-plants, has never been classed by entomologists among the injurious insects, may, from an inexplicable combination of circumstances and conditions, suddenly appear in so great numbers as to enlist general attention to its extensive ravages. No better illustration of this fact can be given than that afforded by recent demonstrations of the Orthopterous insect, *Diapheromera femorata* (Say),— popularly known, from its long and attenuated body and limbs, as the walking-stick, skeleton-bug, spectre-insect, etc. This species, which had long been regarded as harmless and comparatively rare, has within a few years past increased to such an amazing extent in certain localities in Vermont, New York, New Jersey and elsewhere, as completely to devour the foliage of various kinds of trees over broad districts of woodland. In Yates county, New York, on the farm of Mr. G. C. Snow, their destructiveness during the past six years has been most remarkable, having entirely defoliated over twenty-five acres of hickory, oak, etc., and caused the death of a large number of trees. In their travels to obtain food they covered the fences and the ground, and their closely packed bodies were a hindrance to their progress. For an extended and interesting account of their extraordinary multiplication at this locality, the last report of Prof. Riley, contained in the *Annual Report of the Commissioner of Agriculture* for 1878, may be consulted.

Reference to the above insect has been made, prefatory to a short notice of occasional injuries to important crops by the Noctuid moth, *Gortyna nitela* Guen, or the stalk-borer. This insect has not secured a prominent place in the list of insect pests, yet at intervals, in certain localities, complaints are made of serious depredations inflicted by it. More frequently it falls under our notice as a borer in the pith of plants cultivated in our gardens, as in the stems of asters, dahlias, lilies, spinach, etc.

In the early part of July of last year, examples of the larvæ were sent to me for their name and the best way of checking their injuries, from a gentleman residing at Monsey, Rockland county, N. Y. They had appeared in strong force in a potato field, and their burrows within the stems had caused a large number of the stems to wilt, and to break at holes which had been eaten into them for the entrance of the larvæ or for the expulsion of the excrementa. The larvæ were fed by me for some time in confinement. They ate very greedily of

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the food furnished them, and having consumed the pith of a stem, they would emerge and quickly eat their way through a round hole into another stem. They displayed remarkable activity in their movements. I failed in my efforts to carry them to maturity and through their subsequent transformations.

The habits of this insect as a borer, in its larval state, in the interior of growing plants, were first brought to notice in the *Prairie Farmer*, of February 23, 1867.

While many of our insects are confined to a single food-plant, and by far the larger number have a very limited range, this insect feeds on a large number of plants, differing greatly in character. In a notice of it by Miss Emma A. Smith, contained in the *Seventh Report on the Insects of Illinois*, for the year 1877, the following list of plants, the stems of which it bores, is given: Tomato, potato, spinach, wheat, corn, dahlias, asters, lilies, spiræa, salvia, milkweed, castor bean, rhubarb, *Chenopodium* sp. ?, peach twigs, currant twigs, cocklebur (*Xanthium strumarium*), rag-weed (*Ambrosia artemisiæfolia*), and a variety of hearts-ease (*Polygonum*). It also eats the fruit of the tomato and strawberry, and bores into the cobs of ears of corn as well as the stalk.

Among the records of its more serious injuries, are the following: In 1868, a potato field at Lacon, Ill., was observed to have about every tenth stem occupied by this borer (*American Entomologist*, vol. i, p. 22).

In 1869, at Fox Creek, Mo., it was discovered boring into and ruining great numbers of peach "buds" and shoots (*Amer. Entomologist*, vol. i, p. 206).

In 1869, it was reported from Farmington, Conn., as doing great damage to corn in that vicinity (*Amer. Entomologist*, vol. i, p. 252).

In 1871, at Bloomingrove, Wis., it occurred within the straw of nearly all the wheat-fields in the neighborhood. A piece of two acres of early wheat, near Madison, was entirely ruined by it (*Second Rep. Ins. Illinois*, p. 141).

In 1877, at Elmira, Ill., fifteen acres of corn were destroyed by its depredations. At Waterman, Ill., serious injury was done to many fields of corn. At Athens, Ill., it thinned the corn on new lands and foul fields to a considerable extent, proving to be quite destructive (*Seventh Rep. Ins. Ill.* pp. 113, 221). In connection with the above notices of the depredations of this insect in Illinois, it is an interesting fact that the types of the American species of this genus described

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by Guenée — five in number — were specimens which had been collected in that State.

The moth belongs to the *Noctuidæ* — a large class of moths which fly after dark. It is quite plain in appearance, and would not arrest attention when met with, which is but seldom. It measures about one inch and a-half in expanse. Its wings are of a wood-brown color, sprinkled with yellowish dots. The only conspicuous ornamentation is a yellowish-white line at the outer third of the front wings, bent at nearly a right angle near the front margin; between this line and the outer border the wing is paler. It is represented above in figure 1.

1 2

The caterpillar, shown in fig. 2, measures over an inch long when fully grown. It is purplish-brown above, with three white lines on the back, of which the central one is continuous, and the other two interrupted from the fourth to the seventh segments inclusive. The first two segments have a white stripe on their sides, and above the third and fourth fleshy legs (prolegs) there is another white stripe. The head and a corneous plate on the top of the first and last segments are shining yellow, bordered on the sides with black. In its walking, which is quite rapid, the caterpillar arches its back somewhat like the Geometridæ (measuring worms), as it does not use its first pair of prolegs.

In the *Harris Entomological Correspondence*, p. 315, a detailed description of this caterpillar is given. It is described, under date of July 8, 1848, as "a caterpillar on potato stalks" — not referred to any species, as it was unknown to the writer; but it evidently pertains to this insect. The addition of pig-wood is here made to its list of food-plants.

The history of the species, so far as known, is this: The egg has not been observed. It is doubtless deposited by the moth during the early part of June, in our latitude, on the stem of the food-plant, near the ground. As soon as it hatches, the larva eats into the stem, to its pith or heart, and burrows in an upward direction. The hole through which it entered and the lower portion of its burrow is enlarged from time to time with the growth of the larva, to admit of the rejection of its excrementa. If the stem should not afford it a sufficient amount of food for the completion of its growth, it eats a

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hole outwardly for its escape, or escapes through the original opening, and passes to another stem into which it burrows. It attains its growth about the middle of August, when it changes to a pupa, either within its burrow, if affording it suitable conditions, or by deserting it and entering the ground to a slight depth. The pupation is a short one, and the perfect insect makes its appearance during the latter part of August or in September. My earliest date of the collection of the species is September fifth. It is believed to survive the winter in the winged state, and to reappear in the spring to deposit its eggs on the young plants.

This species seems to be a rare one in the vicinity of Albany. Among the scores of thousands of the Noctuids, which during the last few years have been collected by the Albany entomologists, by the *sugaring* method (attracting the moths to a bait spread upon trees), I have no knowledge of the occurrence of a single example of the species.

When this insect occurs in the potato, its presence can be readily detected by the withered stems before they have become broken down. By placing the point of a penknife in the opening and slitting the burrow upward, the caterpillar may be found and killed. If the field be large and too badly infested to permit the employment of this method, then if the vines can be collected and burned before the month of September, all the larvæ or the pupæ which may be undergoing their change within the stems, will be destroyed. As early potatoes are more likely to be infested by this borer than the later ones, the burning method may be easily resorted to.

Another allied species is recognized in our lists — the *Gortyna nebris* of Guenée, differing mainly in the presence of white reniform, orbicular and claviform spots on the front wings, and in slightly longer and more ascending palpi. Prof. Riley has reared *G. nebris* from the horse-weed, *Ambrosia trifida* L., and expresses a confidence that the two forms intergrade, and are simply varieties of one species. I have no knowledge of any description of the larva of *G. nebris*.

Twenty species of North American *Gortyna* are at present recorded. Of these, the larvæ of the greater number, from their concealed habits, are not known. The larval habits of the species are not uniform, for while those which Guenée includes in the genus *Hydræcia* are represented by him as "not living inclosed in stems and feeding on the pith, as those of *Gortyna*, but only concealed among the roots or the basal leaves of the plants" (of which are *nictitans* Linn.,

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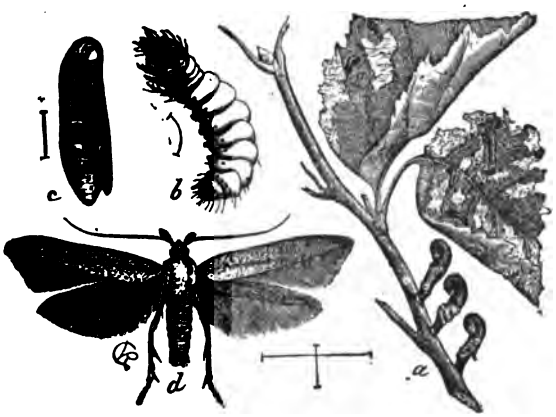
immanis Guen. and *stramentosa* Guen.), others in addition to *G. nitela*, are known to be stalk-borers, as *G. rutila* Guen., in the columbine, *G. cataphracta* Grote, in thistle-stems, and *G. flavago* W. V., of Europe, in thistle-stems and burdock. It is not a little remarkable that of the old Linnæan species, *G. nictitans*, so very common both in Europe and the United States, the larva has not, so far as we have any record, been identified in this country. Our ignorance of the larva of the common *G. sera* Gr.-Rob., is scarcely less remarkable.

The Apple-Tree Case-Bearer—*Coleophora malivorella* Riley.

An insect, quite injurious to apple trees, and previously unknown, has during the last year been brought into notice through its description and account of its ravages by Prof. Riley, in the *Report of the Entomologist* before referred to. I have no knowledge of its appearance in the State of New York, but its occurrence in large numbers in a bordering county—Erie county, Penn.—will undoubtedly soon bring it within the notice of the fruit growers of Western New York.

The new depredator is the larva of a small moth belonging to the family of Tineidæ. The caterpillar, shown at *b* in the accompanying figure, is about one-sixth of an inch in length, of a yellowish color, with a large, black head, its legs yellow and tipped with black, and its last two segments covered with brown granulations and bearing some long hairs. The moth represented at *d* is about one-half of an inch in expanse; its pointed and long-fringed wings are mouse-colored, with some white scales near the base. The tip of the abdomen and the legs are white. The pupal form is seen at *c*. At *a*, *a*, *a*, are shown peculiar pistol-shaped cases, composed of silk, bits of leaves and the excremental matter, which the caterpillars construct for their protection, and which they carry about with them during their period of activity, serving also for a winter retreat and for pupation.



The history of the insect, as given us in the Report above cited, is as follows: The parent moths appear abroad during the latter part of

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July, and deposit their eggs on the under side of the apple leaves. The larvæ hatch in September, and commence to feed upon the under surface of the leaves. They are of the kind known as case-bearers, as they construct for their protection and occupation cases composed of silk, bits of leaves, and their excrementa, which they carry about with them, thrusting out their anterior segments for the purpose of feeding. The cases have a peculiar curve at their posterior end, like the handle of a pistol. At the advent of winter they retreat within their cases, which they attach to a twig, and the less than half-grown caterpillar passes the winter in this condition. At this stage, the cases measure about one-tenth of an inch in length, and are more curved at their ends than the mature form. From their small size and a color almost the same as that of the bark to which they are attached, they are not readily noticed.

In early spring the larvæ awake from their winter sleep, and transport themselves to the swelling buds, upon which they commence to feed. The leaves, as they develop, are attacked in turn, and where the insect abounds, they are rapidly devoured. The younger trees show branches which have been entirely defoliated, while others have been left leafless from the destruction of the buds. The young fruit is also eaten into, until barely a shell of it is left.

About the middle of June, the larvæ attain their growth, when they cease feeding, and fasten their cases to the twigs, and, within them, transform to the pupal state. Their pupation lasts for about three weeks, when the perfect insects emerge, and deposit their eggs upon the leaves, as before stated.

The operations of this insect pest were first noticed in 1877, in the orchard of Mr. William Fairweather, of the Densmore Apple Farm, at McLane, Erie county, Penn. In that year he reports that of the 8,000 trees in his orchard, there was scarcely one which was not more or less affected. On some of the smaller trees, the leaves were completely skeletonized. The following year the ravages were still more destructive, and large numbers of trees were rendered nearly leafless. In a communication just received from Mr. Fairweather, he informs me that the destruction last year (1879) was less than in the two preceding years; but from the number of cases now to be found upon his trees he fears that their number, this year, will be sufficient to eat up every young leaf as it appears.

A parasite to this insect has been discovered in a small Chalcid fly, which seems to be rapidly increasing in numbers, and gives promise of being very efficient in destroying this new pest.

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Notice of Dr. Asa Fitch.

It seems eminently fitting that in connection with the preceding notes upon the economic relations of some of our insects, reference should be made to one who labored long and successfully in the department of Economic Entomology — whose contributions therein gave him an exalted name among entomologists — and to whose enthusiastic, long continued and valuable labors that branch of natural science is largely indebted for the honorable position it now holds in our country.

Dr. Asa Fitch died at his residence at Salem, Washington county, N. Y., on the 8th of April, 1879, at the age of 70 years. His entomological studies commenced about the year 1840, at which time he prescribed for himself such an admirable plan for the direction of his future labors in the field of entomology, that we will be pardoned for quoting it at length. He wrote thus:

"I have undertaken a very great work, and have laid for myself a task both hard in the plan and difficult in the execution. To unite in one very limited body the most essential facts of the history of insects; to class them with precision and accuracy in a natural series; to delineate the chief traits in their physiognomy; to trace in a laconic and strict manner their distinctive characters, and follow a course which shall correspond with the progress of the science and the eminent men who have contributed to its advancement; to single out the useful and obnoxious species, those which from their manner of living excite our curiosity; to mark the thousand sources where the authors of the original knowledge may be consulted; to render to entomology that amiable simplicity which she has had in the times of Linnæus, of Geoffrey, and of the first productions of Fabricius, and yet present her as she is to-day, with all the richness which she has acquired from observation, but without surcharging her with it; to conform her, in one word, to the model which I have under my eyes, the work of Cuvier — such is the end which I have taken upon myself to attain."

During the years 1845 to 1847, Dr. Fitch contributed a series of valuable papers on *Winter Insects of Eastern New York*, and others, to Emmons' *Quarterly Journal of Agriculture and Science.* In 1850, he prepared a descriptive catalogue of the United States insects of the suborder of Homoptera, which was published the following year in the *Fourth Annual Report on the New York State Cabinet of Natural History.* These now scarcely accessible papers richly merit republication.

In the year 1854, his connection with this Society was commenced,

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in his selection by the Executive Committee of the Society to examine and report upon the Noxious, Beneficial, and other Insects of the State of New York, under an appropriation by the Legislature for that purpose. His first report was presented under date of March 14, 1855. Under the continuation of the annual appropriations for the purpose, subsequent reports were annually presented, with the exception of three intervals of a year each — to the number of fourteen — the last one published in the Transactions of the Society for the year 1870. In 1872, by an act of the Legislature, the office of State Entomologist was abolished — the impaired health of Dr. Fitch not permitting him longer to discharge the duties of the position.

The above reports of Dr. Fitch are regarded by entomologists, and others who are prepared to appreciate their merit, as very valuable contributions to science. They are characterized by an untiring zeal, minuteness of observation, fullness of detail, faithfulness of delineation and dignity of expression. They consist largely of the results of original research; and so highly were these researches estimated abroad, that he was elected to membership in the Entomological Societies of France and of Russia, and a gold medal was bestowed upon him by the Central Agricultural Society of France, in appreciation of his services to science. Among his foreign correspondents, he numbered Westwood and Curtis of London, Andrew Murray of Edinburgh, Dr. Gerstäcker of Berlin, Dr. Signoret and M. Selys de Longchamps of Paris, and many others of the most eminent entomologists of Europe.

It may properly be claimed that the New York Reports led the way for similar investigations in other States of the Union, and to the interest which they aroused, we are indebted for the valuable series of Riley's Reports on the Insects of Missouri — nine in number — and comprising over 1,800 pages and numerous illustrations of a high order—the Reports of the State Entomologists of Illinois, and others.

The labors of Dr. Fitch will long be held in grateful remembrance, and the New York State Agricultural Society may justly lay claim to having, by its action in connection therewith, done very much toward the promotion of entomological research, not only within the immediate sphere of its labors, but throughout the Union, and to science at large — co-extensive with the civilized world.

NEW YORK STATE MUSEUM OF NATURAL HISTORY, *January* 20, 1880.

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POULTRY BREEDING, BY NATURAL AND ARTIFICIAL MEANS.

Paper read at the Society's Meeting at Utica, September 10, 1879,
By A. M. HALSTED, of Rye, N. Y.

The science of poultry breeding — for it is a science, and one which has taken fully as much study and patience as in larger stock — is one that is receiving the attention of people throughout the United States as well as in Europe.

The extent and importance to which the interest has grown is almost incredible; especially so to those of us who remember how, in our boyhood days, the chickens were looked upon as a necessary nuisance, to be tolerated because the female portion of the household looked to them for a supply of pin-money. In those days — and those, to us, bygone days, are still things of the present, in many sections of the country — the fowls were regarded as a species of freebooters. They roamed when and where they pleased. If, perchance, they were too free in the garden, the house dog was set upon them to drive them out, or they were pelted with stones, sticks or whatever was most handy. They roosted in summer in the trees around the door yard; in winter under the hovels and sheds, or the carts, wagons, ladders or wherever they could find a place.

For nests they had nearly all creation: the manger in the stable, the hay-mow in the barn, the old sleigh under the cow shed, the blackberry patch in the corner of the hog yard, the brush heap in the wood yard, or the high grass and weeds in the neighboring meadow. Semi-periodical egg hunts were made, and the eggs obtained sent to the country store and traded off for needles, thread and other etceteras; many of the eggs proving to the final possessor to be rather too old for omelet and too young for broilers.

With the young chickens the chances were the same. If a hen succeeded in hiding her nest so neither human nor animal foe discovered it, she usually brought out a brood of chicks nearly as wild as young partridges. Later in the season, as eggs became more plenty at the stores, some hens were set, and as fast as the chicks got old enough they were killed and sold as broilers; those which were

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too wild to catch, and too late-hatched to bring good prices, being left for stock the next season. This was the only "survival of the fittest" known to the poultry keepers of those days. As to feed, the wood pile, barn yard, hog pen and kitchen door steps were the "restaurants" of the summer, and in winter a few handfuls of corn in the morning were thought to be all that was necessary.

The weight of the fowls of those days was from three to three and a half pounds. Occasionally a "bouncer" of five pounds caused the neighbors to inquire into the why and wherefore of its superior size.

The eggs averaged twelve to the pound, and were not over plenty at that.

Ducks, geese and turkeys were rather better cared for; but even they received only enough attention to preserve their lives, which would certainly be lost were they given no more care than the chickens.

Compared with the poultry keeping and breeding of the present day, one can quickly realize the great improvement that has been made.

Eggs average eight and nine to the pound, and frequently, by care and selection of stock, even an average of seven has been produced by some careful breeder. Broilers are made to weigh one and a half to two pounds at six weeks old, and adult fowls frequently dress eight and nine pounds, and I have known instances of twelve pounds and over.

The same ratio of increase is noticeable in turkeys, ducks and geese. Since the poultry interest has assumed such importance, we often find turkeys in our markets weighing twenty to twenty-five pounds. Fifteen to eighteen pounds was formerly considered extraordinary weight; and if a pair of ducks reached eight pounds, the producer was well satisfied he had something above the average. Now ten pounds is not unusual. Last fall I killed both Rouen and Aylesburys, which, at four to five months old, dressed ten pounds to the pair. Twelve, and even fourteen, pounds have been recorded as the weight of full-grown specimens.

The same in geese—the improved breeds, Bremen or Embden, and Toulouse. Twenty pounds *now* is not at all unusual in our Christmas markets. Pairs of the latter have been exhibited in England which weighed, *alive*, fifty-six pounds—nearly or quite double the weights of good specimens twenty-five years ago.

Nor is the improvement confined to size and weight. Quality, as

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well, has been looked for. Plump-bodied, full-breasted, yellow-fleshed and juicy, tender-meated chickens now take the place of the lean and tough broiler of bygone days.

In eggs, the improvement in quality is equally noticeable. The idea that *an egg is an egg*, no matter whether fresh or stale, whether stringy and tasteless, or meaty and rich, has been exploded. We find that there is as much difference in the quality of eggs as with any other article of food; the quality being practically under control of the breeder. If the fowls have to shift for themselves, getting a precarious living in the barn-yard, stable and door-yard, the eggs cannot have the rich, melting quality which results from a good, generous diet of grain and prepared food. We might as well expect the same quality of meat in the half wild Texan steer as we get in the thoroughbred short-horn. The breed or variety has much to do with the quality. A *thoroughbred*, whether in cattle, sheep, swine or poultry, may be relied upon to make a better quality of food than a so-called "*native*" or mongrel. In egg production, as in butter, the thoroughbred produces the choicest quality.

Premising this much brings me to the consideration of the means of attaining the desired quality, which is by breeding and careful selection. My object in referring to, and perhaps comparing, natural and artificial methods, is not to institute a critical comparison between the two, but rather with a view to meet the wants and tastes of the advocates of both systems. And yet they can hardly be called separate *methods* or systems, for "*artificial breeding*" is not an entirely distinct mode of raising poultry, but simply an addition or improvement to the usual method, designed to increase the business, with a lessened expense and greater profits.

I am aware that there are numbers of people who ridicule the idea of raising poultry by artificial means. There is a class of self-complacent individuals who ridicule anything new as preposterous; because their forefathers got along without it, it is not needed now, and, not being needed, it therefore *must* be a failure. Content to plod through their lives in the same old ruts, they receive alike everything *new*. To them the world owes nothing. Steam, electricity, with their results—railways, steamships, telegraphs, etc.—would still be among the unknown, had the world waited for their investigations or indorsement. To this class of people we have nothing to say. Plunged in the darkness of their overweening self-esteem, all attempts to enlighten them prove fruitless. They will not believe the evidence

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of their own senses, much less the testimony of others who have tested the matter with satisfactory results.

I shall consider this subject of poultry breeding from a commercial point of view; that is, rearing them for market—the same treatment, modified, being adapted to the needs of the breeder who raises only enough for his own table.

First, then, the location. My selection would be a dry situation, with a southerly or south-eastern slope. If on the bank of a lake or pond, well; but I should prefer a small stream. A rough piece of land, with some underbrush and rocks, is not objectionable, unless the rocks are broken and piled up, so as to make a harbor for rats or weasels. Some underbrush is desirable for shade, and, if there was none on the place selected, I should plant low-growing evergreens and currant bushes; the latter are beneficial for their fruit—the fowls being very fond of it—as well as for shelter from the heat of the sun.

In the buildings to shelter the fowls I would advise a number of small houses, rather than one of large size, for the breeding stock. A convenient as well as economical way would be to build each house *double*; that is, to shelter two yards or flocks of fowls, letting the dividing fence join the house in the center. Houses twelve feet long by eight feet wide, six feet high on the back, and eight feet in front, will make two apartments, each large enough to accommodate fifty hens and four cocks, which are as many as had best be kept together. Provision must be made for ventilation, which in hot weather must be ample. The yard for this number should not be less than one-quarter acre, two-thirds of which should be in grass; the remainder, in bare earth, should be turned in alternate portions, either by plow or spade, every week. A small shed, not necessarily over three or four feet high—a few boards held up by a light frame will answer—should be provided, under which fix a dusting place of fine sand, wood ashes and some tobacco dust. It is thus dry in all weather. In exposed situations, I would make this shed, for winter use, by raising the front three feet high, and letting the back down to and even with the ground, having it open to the south. In another part of the yard place a trough or shallow box, in which keep a supply of fine gravel; unless the soil is gravelly, in which case it is not needed.

In fencing the yards, the height will have to be regulated by the breed of fowls kept. The Asiatics require only a fence of three feet to keep them in bounds, while the Leghorns and other light-bodied kinds will readily go over a board or picket fence six or eight feet

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high. The past season I have put up some fencing of wire netting, five feet wide, with a board underneath, making the fence nearly six feet high, and I find my Leghorns are perfectly controlled by it—better, in fact, than by a picket fence two feet higher, which I had been using. In putting up wire fencing, never use a top rail; it gives the fowls a foot-hold to light upon, and they are certain to fly over.

In addition to the buildings for the breeding stock, there will be required a sitting or hatching room; a nursery for the young chicks, which should be partly covered with glass; and a second building, into which they must be placed when four to five weeks old. The size of these buildings is to be governed by the extent of the business. Besides these, there might be properly used one or more sheds, peaked roof, open on all sides, with perches placed not less than four feet from the ground. After the middle of April, the chicks that are old enough should be made to roost in them.

In the selection of stock, the breeder must be governed by the character of the business he has in view. If the production of eggs be the chief object, then his choice would naturally be the Leghorns, Houdans, or a cross of these upon some other breed. If the raising of poultry for market, his choice would have a much wider range. On this point we could hardly find any two fanciers perfectly agree. One, with his Brahmas, is positive nothing can be better; another says his Cochins leave nothing to be desired; a third swears by his Games; and a fourth is confident the Houdans are the best in all creation; while still another, agreeing that all these may be good in their way, *knows* that his crosses combine more *good* qualities than it is possible to get into any one pure-bred variety. And each one is right in his opinion. The breed he has *suits* him, and he can make more out of it than he could from some other kinds, which, not being fancied, would receive less care and attention from him.

We see this question of "What breed shall I get?" illustrated over and over again in this way; and our advice to such inquiries is, try that which best suits your fancy. You will undoubtedly make that succeed. Of course, in such advice, it is understood that the selection will be made from some of those varieties which excel in the qualities desired.

In selecting the laying stock, it is best to have one-half pullets of the last season's hatch, and the remainder hens of one year old. Mate the first with adult cocks, the last with cockerels of the previous year. This gives stronger and more vigorous progeny. In the choice of cocks, select strong, vigorous birds, with a loud, long, full crow Such

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a bird has abundance of lung power, and necessarily is in perfect health. Select your hens with a view to what you expect from them. By thus selecting the stock, we have no cessation of eggs. The pullets commence laying in the late fall or early winter, and by the time their first clutch is laid out, the hens are ready to take up their share of the work. This is usually in February; and by the middle of March they are through their first clutch, and, if not of the non-sitting breeds, ready to assume the duties of incubation.

Much of success depends on the *care of the eggs.* In cold weather, it is best to gather them twice a day, morning and night; and in warm weather once a day, at night. If neglected, and a broody hen should remain on them over night, the chances are that they are spoiled. A very few hours of the proper heat develops the germ, and if a cessation of heat follows the life is killed.

Some few years since, a tabulated statement went the rounds of the press, showing that a hen could not possibly lay more than 600 eggs during the course of her natural life. This number was *parceled out* as follows:

During the first year after birth	15 to 20
second year	100 to 120
third year	120 to 135
fourth year	100 to 115
fifth year	60 to 80
sixth year	50 to 60
seventh year	35 to 40
eighth year	15 to 20

This was assumed from a microscopic investigation of the ovarium of a hen by some European savant.

For once, science is wrong. Within the past five years, a number of persons have kept careful count, and have found an egg production in some cases of nearly 1,000 during the eight or nine years of a hen's life. I, myself, have had a yield of over 350 eggs per hen in two years' time, from a flock of Creve Cœurs, and my brown Leghorns yearly exceed that record.

The present season, since January first, from a flock of sixty-one hens at first, of which two died in February and March, and thirty-four were killed for the table prior to July, I have gathered, up to September first, 6,257 eggs. Taking forty-three as the average number through the season, this gives an average per hen of 145 eggs for eight months. Of these sixty-one hens only twenty-five were brown

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Leghorns, six were light Brahmas, four Plymouth Rocks, and the rest crosses and mongrels. Had the flock been all Leghorns, I have no doubt but the average would have been fully 175 eggs per hen.

This production of eggs may be forced by suitable feeding; and in breeding for profit it should be done. Assuming the table given above as correct in the proportion of eggs laid at certain ages of the fowl, it follows that, to get the full value of the egg production, we must keep her until the fourth year. If, by proper feeding and attention, we can cause her to lay three-fourths or more of that possible number during the first two years, we can then fit her for market, and fill her place in the yard by younger fowls, to go through the same forcing process. It is folly to feed and keep a hen four years, when the bulk of profit may be obtained from her in half that time. I should therefore advise fitting her for market as soon as she has finished the best of her second season's laying, which is usually about June.

The cocks may be kept until three years old, if desired, but usually two years will be found the most profitable age to market them.

The Asiatics, and also some other varieties, are sometimes troublesome in their disposition to sit. When they are so persistent in the matter, and it is desired to have them laying again, either of these two methods will be found efficacious: Put the hen in a box with a lath bottom, the lath not over an inch wide and two inches apart; the box raised a foot or more above the floor. Having no way of keeping her feet and breast warm, the feverish desire to sit is soon cooled off, and usually in three days she is ready to be turned again into the yard. Another remedy is to put the hen in a small pen, with no perches, and place with her a vigorous young cock, kept by himself for this purpose. Two or three days will usually effect the desired result. Where the hens are to do the hatching, they need to be moved to the sitting-room. This should be done at night. Have the nest ready, with a half-dozen nest eggs, and fitted with a cover. After dark, take the hen, in a basket, to the room, and gently place her on the nest, covering or shutting her in. Do not open the nest again till the next evening, when let her out and give her food and water; after fifteen or twenty minutes, if she does not go on herself, catch her and put her on again, shutting her in. This may need to be repeated three or four days; but usually, unless the hen is nervous and wild, she will take to her nest of her own accord after the second day. When she does, then give her her eggs.

The French use turkeys for hatching, and in some cases on quite

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a large scale. In some sections there are men who follow it as a business, hatching out chickens for the neighboring farmers at so much a piece, or buying the eggs and selling the chickens as soon as old enough. One person in the vicinity of Lyons has sixty turkeys sitting in the hatching season. It is not necessary that the turkeys should be broody. When wanted they are caught, given a small wineglassful of spirits, and placed on the nest with some dummy eggs under them. When they come out of their "drunk," they either imagine that they have legitimately begun their new business, or are so ashamed of their spree that, rather than show themselves to their mates, they remain in seclusion.

Another method, somewhat longer, is sometimes used. The turkeys are caught and placed upon nests, the same as described above for hens, and treated in the same manner, and in two or three days they become broody and are given good eggs. These turkeys are kept sitting two or three months at a time; as fast as the chicks hatch they are taken away, and a fresh nest of eggs given to her. An ordinary sized turkey will cover twenty eggs.

Artificial incubation and incubators have now been brought to such high perfection that it seems almost folly to cling to the old methods, except when it is impossible to avail oneself of the new.

The artificial method is far ahead of the natural, in that every fertile egg can be (and has been, again and again, the past season) hatched. In it we have to allow nothing for breakage by hens, or loss by hens leaving their nest, or trampling the half hatched chicks to death by young and nervous hens. The cost of incubation is less, and the "artificial hen" always broody when you want her so.

In both the natural and artificial methods it is necessary to full success that the eggs receive a daily airing. The hen must be taken off her nest, if she does not come off, of her own accord; and the eggs in the incubator must be taken out and aired for ten to twenty minutes. The *natural* treatment must be followed in both cases.

During dry seasons it is well to sprinkle the eggs twice or three times a week, while the hen is off her nest. In the incubator they should be sprinkled daily. This keeps the shell and inner membrane soft, and the chick comes out quicker and stronger. As the chicks dry off take them from the nest and cover them with any warm substance until all are hatched; then if the hen is to mother them put her out with them.

Just here, the artificial mother or brooder comes in as an aid to the

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natural system. As fast as the chicks dry, take them from the hen and put them in the brooder. This being kept warm by a small lamp, keeps them warm and dry and gives them all the brooding they need — more than the hen, for the artificial mother is always ready to hover her chicks, which the hen is not.

The hen can then be given another nest of eggs, and in some cases even a third clutch may be had. When turkeys are used, four, five and even six hatches have been obtained in succession. This, however, necessitates a great deal of attention, for the turkeys will not leave their nests voluntarily, but must be taken off regularly and fed, and the nests cleaned. Frequently after the third sitting they refuse food, and then have to be fed by hand, or crammed.

The young chicks need no food until about twenty-four hours old; then give them the yolk of a hard boiled egg, crumbled or chopped fine. This may be their food for two or at most three days, after which mix coarse corn-meal and wheat bran, equal parts, and *scald* it with boiling water. When a week old, add once a day a fourth part of ground scraps, or a little boiled meat or liver, chopped fine. Have a pan of fine gravel within their reach and also some lime rubbish, old mortar, or broken oyster or clam shells. If near the sea-shore get a few bushels of shells, throw them on a pile of brush and burn them; then break them up and put them in the yards for both old and young fowls. At two weeks old, begin feeding cracked corn, wheat, or buckwheat at night. Up to this time the chicks should be fed from five to seven times a day; every two or three hours; after three weeks old three times a day will be sufficient.

In addition to the *menu* given above, there may be added occasionally feeds of boiled rice, small potatoes boiled and mashed and mixed with a little corn or barley meal, bread crumbs and stale bread steeped in milk or water. In fact all the scraps from the table should be saved and given to them as soon as they are old enough. On the farm, where milk is abundant, scald the meal with the hot whey of curded milk, mixing the curd in with it. Into this a little red pepper and powdered charcoal may occasionally be put. Vegetable food should always be given at least every other day: cabbage leaves chopped, a few carrots minced fine, onions also chopped may be mixed with the scalded food; until about a week before killing, when the latter should not be given; best of all is lettuce, this may be raised in shallow boxes (called flats by gardeners) which can be started in any sunny window, and if placed at night out of reach of frost, can be raised without any artificial heat. The value of table scraps

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as food for both old and young fowls is rarely fully estimated. If in the vicinity of a large hotel, the breeder would be well repaid even in buying the scraps and carting them home.

The success of Mr. Warren Leland in his poultry raising was largely due to this supply of food. At that time he was one of the proprietors of the Metropolitan Hotel in New York city, all the scraps from which, amounting to fifteen or twenty barrels weekly, were sent to his farm, and used for feeding the poultry and pigs.

To give delicacy of flesh to the chicks, make their principal food, for a week or ten days before killing, barley meal moistened with milk. Alternate with Indian meal scalded with either water or milk. During this process the chicks had best be kept confined in a darkened room. If the business is conducted on a scale sufficiently large to warrant the expense, I should advise the use of a fattening house, with apparatus for cramming. This process is better adapted to older stock — say six to eight months birds, but still may be used with profit on broilers from the sixth to the eighth week.

Bear in mind always, that the profit in chicks is made by getting them fit for market at the earliest possible age; and to do this they must be fed early, often, and no more than they will eat at a time. Give them fresh, clean water to drink; placing the drinking vessels where the sun will not reach them, and where the chicks will not scratch dirt into them. The average cost of hatching and raising a chicken (I speak now by artificial means) to eight weeks old is not over fifteen cents. At this age it should weigh from one and a half to two pounds, if forced. The cost of the next two months will be full fifteen cents more, while the weight will not gain over one pound. It follows, therefore, that the most of the profit comes from the first two months' care and feeding. Broilers at that age, in New York, Philadelphia or Boston, will sell during April, May and June at from seventy-five cents to one dollar per pair, and sometimes as high as one dollar and fifty cents per pair early in the spring.

At this rate there is a large profit on the early-hatched broods; and prices for good broilers (plump chickens under two pounds each) will usually hold up to fifty and sixty cents per pair until October.

During the late fall and winter months an eastern breeder cannot hope to compete with the western producers. Adult fowls can be raised there and marketed here (during cold weather) at much less figures than we at the east can do it. It is only by improving the *quality* of the birds marketed, and getting them into market at an early age, that we can make a paying business of it.

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To do this, the breeder must avail himself of artificial means. It is an absolute necessity to success that he employ incubators and brooders in connection with the natural methods.

I say, "in connection with," for I do not advise the use of artificial means to the entire exclusion of the natural. Taking, for instance, a business in which it is proposed to keep 500 hens; these, at an average of 150 eggs each, will give 75,000 eggs per year. Now, allow each hen to sit twice, thirteen eggs being her nest; we have then used 13,000 eggs, and have 62,000, which we are obliged to dispose of otherwise.

With six incubators, of 200 eggs capacity each, we could use all of this surplus, and produce a total of 53,550 chickens. Allowing each hen to hatch ten chicks per sitting — twenty chicks in all — we have 10,000 more, making 63,550. Now, the care of these six incubators need not take over three hours per day; while the proper care of the hens, the necessary watching to see that they do not get off their nest, feeding, watering, cleaning the apartment and nests, etc., would take fully as much time, and if only 100 hens were sitting at once, the time would extend through seven months, with a return of less than one-fifth that of the incubators.

In this we have given the hens credit for about seventy-seven per cent, while the *average* hatch with hens, where large numbers are kept and set, is not over sixty per cent. Figuring at this latter per centage, we should get only 7,800 chickens against 31,237, which would be equivalent for the incubators for the same length of time.

The incubators we have credited with a hatch of eighty-seven and a half per cent, while ninety and ninety-five per cent are now common averages with the Centennial Incubator (one of which is now on exhibition on the fair grounds).

Next we will consider the advantages of artificial rearing over the natural method. This, of course, involves an outlay for brooders, or their equivalent. Here let me say, in an extensive establishment of the kind we have under consideration, I should advise a building fitted with permanent brooding arrangements. Now, returning to our natural method, we have 500 hens, each of which is expected to hatch two broods of chickens, 100 of which are supposed to sit and hatch every three weeks. Allow each hen to have twenty chicks, and we have fifty coops to provide every three weeks. Each hen will run with her brood four weeks, and early in the spring the chicks must stay in the coop until six weeks old. For winter raising, which *must* be done, a house will have to be prepared and the hens and

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coops kept in it. This will necessitate the use of 150 coops, which, at two dollars each, will cost $300. To this may also be added the cost of the house. If portable brooders were used, and the chicks taken from the hens as soon as hatched and put into them, it would require twenty-five (25) brooders, which would cost $375. These can be used in the open air and need no house, an open shed for the chicks to run and wallow under in stormy weather being all that is necessary. The *cost* would be about equal in both cases; while the labor in caring for them would be largely in favor of the brooders, in that with the coops there would be 100 to be fed and shut up every night, against twenty-five of the brooders. Then, again, with every coop and old hen there is much dirt and filth to be cleaned out every few days as there will be in a brooder for a month, the hen fouling the coop more in one day than a brood of fifty chicks would in a week. In addition to this gain, is that of the use of the hen for five or six weeks, during which she may be made to produce twenty or twenty-five eggs.

But discarding the portable brooder, and using a house fixed as suggested above, the entire expense for the accommodation of the chicks hatched by that number of hens need not exceed $500.

The saving in labor alone, over the hen and coop system, would pay a large interest on the investment. To go into it as extensively as the above mentioned estimate would necessitate, would preclude the use of hens and coops in rearing, and the artificial method would have to be adopted; and while the first expense would have to be comparatively large, it would require a very small annual outlay to keep every thing in working order. The saving of chicks from casualties, from neglect, by the hens pecking and trampling, has been found to more than repay the outlay, even in small poultry establishments. In large enterprises the per centage of loss is always more, and the saving would consequently be still greater.

DISCUSSION.

After the reading of the paper, the author was interrogated by the audience, and the following dialogue took place:

Q. Are chicks raised by the artificial mother as healthy and vigorous as those raised by the natural mother?

A. Yes, more so. With the natural mother, in a few days lice are found in the head of the chicks, which appear to be the foundation of the lice crop. With the artificial mother, this is avoided. She does not wander and cause her chicks to perish by exposure. They need to be kept warm, well fed and clean.

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Q. Do artificially hatched chicks suffer from gapes or chicken cholera?

A. No; they are free from lice; and I have found that the first lice, under the microscope, are different from those illustrated by the authorities. I also have found there is some connection between them and the gapes. When kept free from these lice, gapes do not appear. Gapes are caused by little worms in the windpipe. How they come there, no one knows. Certainly, when kept free from these lice, the gapes do not trouble the chick. These first lice in the head of the chick appear like ticks, burying in the skin so that the chicks will peep when the tick is pulled out. I have never had cholera among my chicks. The cleanliness that keeps off the lice may also keep off the insect that produces the gape worm.

Q. Is it necessary to exercise particular care in handling eggs to be set, in order to have them hatch?

A. They have to be handled like eggs; but I have never taken any special care in handling. They will stand much rougher usage than many suppose. I have transported eggs long distances, and had good luck in hatching them. Eggs sent to fairs have hatched well in the incubator. An egg will stand more neglect than is supposed. If we give it a violent jar, that breaks the thread-like connection of the egg with the ends of the shell, it will not hatch. So long as this connection remains intact, no harm is done.

Q. Have you suffered any loss of eggs from thunder?

A. I have had no loss from the effects of thunder. In one instance, some goose eggs were apparently retarded two weeks in their hatching, by thunder, the hen sitting on them six weeks instead of four. But only three goslings appeared.

Q. How many hens are necessary to work an incubator profitably?

A. It depends upon what we raise chicks for. The incubator will hatch 136 eggs. It will be best to begin with twenty-five or thirty hens. These will keep an incubator running. You may start the sitting under the hen and remove the eggs to the incubator when there is room. If 300 chicks a year are raised, there will be a saving of full twenty-five per cent. I would almost guarantee 100 chicks from every incubator full of eggs.

Q. Do you feed food raw or scalded?

A. I scald, and believe it pays to cook. There is a decided saving, and animals as chicks do better on cooked food. I feed differently to fat from what I do to make hens lay.

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Q. Can the incubator be kept running by putting in eggs as fast as the chicks come out?

A. Yes. You can begin with six eggs, and add as fast as you get the eggs, so that chicks may come off every day and eggs be added.

Q. Will cistern water breed disease?

A. That depends upon how the cistern is kept. I can't see why clean rain-water should be worse for chickens than cattle. Foul water is bad, but pure water from any source is wholesome.

Q. Have you ever used stimulating food to make hens lay?

A. No. I give good wholesome food in generous quantity. It cannot be good to artificially stimulate. I once tried feeding during the night. This was for fattening, and at the suggestion of a friend, who in one instance made chickens six weeks old weigh one and a half pounds by night feeding.

Q. Would you recommend night feeding?

A. Yes, if I were raising chickens for market. But, after six weeks, profit in feeding ends or greatly diminishes. After that, the chickens require double the amount of food to produce the same growth. For fattening, the brown Leghorn at six weeks is about as good as any. Have found a cross of Dorking cock on a light Brahma hen profitable for market.

Prof. Law said he imagined he saw in the incubator an escape from chicken cholera and other diseases. Parasites in the intestines cause cholera. Keep hens clean, and give them clean food, and disease is escaped. Foul water, as the filthy pools in the barnyard, is likely to breed disease by introducing parasites or their eggs. The chicks picking the lice off each other's heads may become diseased, the larvæ being thus introduced.

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ABOUT POTATOES.

Paper read at the Society's meeting at Utica, January 12, 1879,
By ISAAC F. TILLINGHAST,
of Factoryville, Pa.

History informs us that potatoes were first found growing in the wilds of South America, early in the seventeenth century; but they were by no means found in the state of perfection of the beautiful mealy tubers that may be seen to-day upon our dinner-tables.

For nearly a century, so slow was their improvement that they were cultivated to but a very slight extent as an article of food. But how great a change has been wrought within the last half century? To-day, as a staple article of food, the potato stands next in importance to wheat in nearly all sections of the globe. It is one of the necessities of every-day life, esteemed alike by prince and peasant; therefore whatever can be done by our American farmers to improve it in quality, or to prevent its deterioration, should by all means be taken advantage of.

That the natural tendency of the potato, when propagated from tubers in the usual manner, is to retrograde, is a point which I think is no longer questioned by any observing grower — the rapidity of the degeneration depending greatly upon the circumstances and conditions under which it is grown. The cause may be continued planting for a series of years of the same seed potatoes upon the same soil, or in the same locality — unsuitable soil — injudicious use of fertilizers, or the lack of them — want of vigor, either constitutional or caused by unfavorable seasons, or imperfect cultivation and neglect. The remedy is not only to procure varieties recently produced from the seed ball, but to select such new ones that have the greatest amount of natural vigor. While it is imperative that we frequently procure a newly originated variety to produce the best results, it must be remembered that the simple fact of its being new is by no means a guarantee that it is valuable. Probably not more than one in five hundred of the chance seedlings produced from balls taken at random from a field will be of more value than its parent, while many of them will so closely resemble the parent that they are not readily distinguishable. In

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nearly every instance of new varieties which have possessed intrinsic merits enough to enable them to stand the trial and become general favorites in widely-spread localities, the originator selected them, by a careful comparison, from hundreds and in many instances from many thousands of seedlings. The chances of producing a new seedling more meritorious than those we already have are probably no greater in potatoes than in apples or other fruits. The Rhode Island Greening, Northern Spy, and Baldwin, and in fact all of the magnificent varieties of apples which are displayed upon the tables at the fair ground, of course originated from apple seeds. Yet how many natural fruit seedlings do you imagine you would have to produce in order to find one among them which would even equal those justly celebrated varieties in combined valuable characteristics? If our best and most vigorous varieties are selected as parents and the blossoms fertilized with pollen from other vigorous varieties, which possess different but equally valuable characteristics, the results of combining the valuable traits in the character of each will no doubt be seen as surely in vegetable as in animal life. For these reasons our best new varieties are from hybridized seeds planted and cultivated in a manner calculated to inspire as great a degree of productiveness and vigor as possible. And yet we neither hope nor expect even these to retain their productiveness for many years. Even the best among them must give way as fast as they lose their vigor, and newer and more vigorous varieties make their appearance.

The vigor and productiveness of any variety of potatoes may be greatly prolonged by annually selecting for seed the largest and most matured tubers and being careful to keep the plot from which the next season's seed is to be selected in the highest possible state of cultivation.

By this I do not mean excessively manured — for that might tend to produce disease — but thoroughly tilled.

Small Potatoes are unfit for use for several reasons. A continual planting of them will soon reduce the vigor of any variety. They are more apt to be unripe and lacking in vitality. In using small potatoes for seed you will almost invariably get too many eyes in each hill and the consequence will be so many sprouts will start from one point and so many new tubers will form that none of them can have a chance to develop fully, hence you reap what you sow — only small potatoes. Two, or at most three, good eyes in a hill is seed enough in any case and larger tubers will be formed by planting only one, hence cutting the tubers and dividing them before planting is advised. A

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small tuber contains about as many eyes as a large one. If deposited whole too many eyes are planted, if divided the pieces do not contain sufficient substance to properly nourish the young plant until it can get its sustenance from the soil. The very best results may be obtained by selecting the largest and handsomest specimens. Then cut out or remove all the eyes except one or two of the strongest and plant as much as possible of the potato, and but one in a hill. In this way you will get a strong and vigorous growth from the start, and the more vigorous your vines the larger and better will be the product as a rule. Especially will this be desirable since the advent of that devouring enemy the Colorado beetle.

Of course such a process is altogether impracticable to perform on a large scale, as the amount of seed required would be too great. For field culture I therefore practice selecting the largest specimens for seed and cut them into one and two eye pieces.

Hills or Drills

Is the next question to be considered. This is simply a question of land against labor. A third more potatoes may readily be grown per acre by drill culture, but a third more labor will be required to produce them.

Constituents of a Potato Crop.

In Johnson's "How Crops Grow," 1,000 pounds of potato tubers are said to contain five and six tenths pounds of potash and one and eight-tenths pounds of phosphoric acid. At sixty pounds to the bushel, a crop of 300 bushels of potatoes would weigh 18,000 pounds, containing 100 8-10 pounds of potash and thirty-two and four-tenths pounds of phosphoric acid. As the tops are always returned to the soil nothing is lost by them. They contain, however, much less potash and phosphoric acid than the tubers, weight for weight. Other authorities give the amounts much greater than this. Potash, therefore, from the part it plays in the formation of starch in the tuber and growth of tops or vines, seems to be one of the most necessary ingredients of a compound to be applied to help in the formation of a crop of potatoes; and if not already existing in sufficient quantities must in some manner be supplied. Ashes, German potash salts, muriate of potash, and various commercial substances are frequently used to supply this deficiency in worn soils. But I find that where any of them are used, to produce the best results they must be used in connection with vegetable matter of some kind, such as a good clover sod turned under, or a coating of stable manure, to loosen the

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soil and give it a proper mechanical composition. And further, they must be spread broadcast, and thoroughly mixed with the soil by harrowing—for if placed directly in the hills without mixing thoroughly with the soil, there is great danger of giving an overdose and killing the young potato shoots outright.

Should they be fortunate enough to escape this fate, if not well mixed, and the season be in the least dry, the potatoes will at best be but a scabby lot.

The average yield of potatoes in this country is, I think, according to census returns, less than 100 bushels per acre, yet there is vastly more profit and pleasure in producing them at the rate of 300 or 400 bushels per acre, and until our farmers succeed in obtaining this yield they have yet something to learn about growing potatoes.

If the fertility of your soil is to be maintained by the application of stable manures, as it is in a great majority of instances in this country, it should be applied the year previous to occupying the ground with potatoes, as fresh manures have a tendency to produce potato rot. It is by no means a direct cause for the disease, but tends to stimulate them into a condition by which they are more liable to be affected. There has, during the past few years, been a great deal of investigation and discussion going on in England to determine, if possible, the cause and cure for the disease known as potato rot, which attacks the potatoes before they are fully mature. I do not think that a definite cure has been or soon will be determined upon; but the results of the investigation goes to show that *new* and vigorous varieties are much less frequently attacked than those which have been grown for years until weakened and degenerated; also, that potatoes planted upon land which is thoroughly under-drained are much less subject to the disease than upon undrained lands in which a heavy clay subsoil holds too much water in the hills during the hot weather of July and August. The liability of potatoes to decay after being dug and stored, is, in my opinion dependent more upon the manner in which they are handled than upon any predisposing cause.

Potatoes which are intended for keeping for any considerable length of time, absolutely require very little handling. Many growers of potatoes act very unwisely in this respect. They gather their potatoes up and pour them carelessly into a wagon body, draw them to the cellar, then proceed to shovel them out, cutting and bruising without regard, and perhaps pitch them down a chute, as they would coals, into the cellar; then they are astonished to find that they are rotting in the pile before spring!

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Some potato growers, after having had experience similar to this, eagerly conclude that potatoes must not be dug and stored in cellars until late in the fall! My own practice is to dig them when ripe, frequently in August, and place them carefully in barrels in the field, as soon as the sun has shone upon them long enough to dry them off. The barrels are then carefully transported to the cellar and packed away, the potatoes remaining in them. The cellar should be dry and dark, and *well ventilated.* It should be so arranged that a door or large window can be opened at any time, upon two opposite sides, so that a draught of air may be made to circulate freely. This airing should be attended to, in order to keep the temperature low enough to prevent the tubers from sprouting.

I shipped potatoes to Delaware, for late planting, after the middle of last June, which had been kept in this manner since the previous August without being once handled over, and it was at this late date scarcely necessary to look them over, as none had decayed, and the eyes but slightly started.

The great importance of keeping eating potatoes entirely from the light is under-estimated by many house-keepers. The chemical action of light upon potatoes will, in a very short time, produce a change within them which renders them unfit for food. If only exposed for a few hours to a strong light the quality will be very materially injured.

A number of very valuable new varieties have been disseminated within the last two or three years and others are being rapidly brought out. I annually plant over 100 varieties, consisting of standard sorts and most of the *newer* introductions. A few hills of each are planted side by side, in a trial patch, and given, as far as possible, an equal chance in all respects. Thus I am enabled to note the great difference in the vigor and productiveness between the old and new varieties more readily than most growers. The specimens in the collection which I have had on exhibition at the fair grounds this week were mainly selected from a plot containing but ten hills of each variety, planted with but one eye in each hill. They are therefore selected from a comparatively small quantity of each variety. A duplicate collection of the whole number has been taken from the same plot, which is now on exhibition at the Pennsylvania State Fair, at Philadelphia.

The seed potatoes which were planted to produce these were the identical specimens which I exhibited at your fair at Elmira last season.

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Among the newer varieties shown last season, the *Early Ohio* and *Burbank Seedling* have fully maintained the favorable opinions which I then held for them. The *Genesee County King* also continues to please, and will, no doubt, become popular. Of the more recent introductions, the *Early Success*, *Early Williston*, *Beauty of Hebron* and *Mammoth Pearl* are the most promising that I have tested. The latter (the Mammoth Pearl) is one of the most vigorous varieties that I have ever grown. The vines come up large and strong in the beginning, and continue to grow most rampantly until they will completely cover the ground, even when planted four feet apart each way.

The potato-bugs will, of course, eat them, but they grow so rapidly that their ravages do not seem to injure the potatoes in the least.

The tubers are nearly round, large and very white. They are solid and sound to the center. They seem so vigorous and productive that they must become popular; yet having grown them but a single season, and in but limited quantity, I cannot say they will be faultless, as they may yet dissappoint me.

A couple of years ago, I obtained a large red seedling from the originator which gave me in every way much satisfaction. I grew a limited quantity of them last season and sent them out under the name of *Triumph*, which seemed very appropriate. B. K. Bliss & Sons, of New York, at the same time offered a new variety under the same name, which has occasioned some confusion. I have therefore decided to hereafter call my seedling the *La Plume*, after the town in which my seed farms are located.

In selecting a variety the grower must cater to the tastes of his market. The Albany market prefers a white potato. The Prince Albert was a favorite in it for years. The Burbank seedling must, therefore, prove a real acquisition in that region, inasmuch as it very closely resembles that popular old standard in form and color, while in many respects it is a better potato to-day than the Prince Albert ever was.

In Scranton, Pa., and in fact in most other coal-mining towns in which the population consists greatly of Irish and Welsh, a red potato is demanded. The "Chili" has been their standard for a number of years, and while the Rose class will sell quite readily, a heartier, coarser grained and redder variety is greatly preferred.

Brownell's Beauty was of the right color and shape to suit here, but on account of its tendency to rot, of late it has rapidly gone out of cultivation.

The Snowflake is by many regarded as the finest in quality of any

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variety now cultivated. When well grown it is also one of the handsomest in appearance. It requires very rich, loose soil and light seeding — single eyes being preferable, as it is naturally inclined to set too many tubers, which crowd each other and do not attain their full size.

The Early Ohio is a fine productive sort. Every person who has tested it, so far as I know, allows that it is a week or ten days ahead of Early Rose in maturing. It requires a rich soil, as the vines are rather dwarf in their habit. The tubers are nearly all of marketable size and most excellent in quality. Mr. Brownell, of Vermont, sent me two new seedlings for trial last season which promise well. Both are smooth, white, early varieties. They are named Early Success and Early Williston. Both are deserving of further trial.

The *Beauty of Hebron* was widely disseminated in small lots last spring. In shape the tubers somewhat resembles the New York Late Rose. Their color is lighter and season a little earlier. So far as I can judge it is a capital variety. Probably a seedling of the Rose.

The Superior is a beautiful long red variety. It is remarkably smooth, sound and brittle. Though not very late in maturing the tubers keep in the best condition for late spring use of any variety I grow.

The excitement caused by the Colorado beetle has greatly subsided within the last two years. Our largest growers now pay but little attention to it. Many have discarded Paris green entirely. The old beetles, or "seed bugs," as they are termed, are destroyed wherever found at the first hoeing, after which but little attention is paid to them. Like most other obnoxious insects, they have parasite enemies, which have increased to such an extent as to materially check their ravages. Potatoes are in price periodically and alternately high and low. Like the patent safety-valve on a steam engine, this matter regulates itself. When they bring a good price in market in spring, our farmers refuse to sell and plant all they can manage. This produces a surplus and the lack of demand runs the price to a point below the actual cost of production. This disheartens the growers and they with one accord conclude "potatoes don't pay," and refuse to plant more than they want for their own use. Unlike a crop of grain, the surplus of one season cannot be carried over to make up the deficiency of the next. So they have their "ups and downs," and the only safe way for a potato grower is to either go by the rule of contrary, or to plant a stated amount each year regardless of the prospects.

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The present has been or *is* a great potato season. A large acreage was planted and the crop is generally good throughout the Northern and Eastern States. They have already been sold in the Scranton market as low as twenty-five cents per bushel. I would much rather buy than sell at this price, as I am confident that any *good, early variety*, such as the Early Ohio, will be in good demand before another planting season rolls around. There is certainly but a limited quantity of early varieties, which are pure and good for seed, in existence, and those who have them may confidently look for an advance in prices. The reason is that they were not to be had last spring for planting, and as the price was very fair and money scarce, they were thrown upon the market as soon as fit for eating.

I also hear considerable complaint of *rot* in different sections, so that I would advise those having good potatoes not to waste them because they are now cheap.

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THE INSECTS OF THE CLOVER PLANT.

A Paper read before the Society, at the Annual Meeting, January 19, 1881,

BY J. A. LINTNER.

In inviting your attention to a notice of the insects depredating upon the clover, I have been led to do so, first, in consideration of the value of the clover plant; and second, from the great increase of insect depredations upon it.

The agriculturists of New York need not to be told of the value of this plant. They were the first to discover its importance, and very early in the present century it was cultivated upon almost every farm in the State.

In the absence of any definite statistics, I believe that I am safe in asserting that it is more extensively cultivated in this State than in any other — perhaps owing to its peculiar adaptability to the soil.

Its cultivation is rapidly increasing throughout the United States.

At the risk of stating what may be truisms to all present, permit me, as prefatory to further remarks, to present the following testimony to the importance of the clover crop — mainly drawn from a valuable paper in a late volume of the Society's Transactions.*

The agriculturists of Great Britain declare that the cultivation of clover in that country is one of the twin roots of its wonderful prosperity — the turnip crop being the other.

Mr. George Geddes in his *Survey of Onondaga County*, states: "The agriculture of Onondaga county is based on the clover plant. Strike this out of existence, and a revolution would follow that would make it necessary for us to learn everything anew in regard to cultivating our lands. If our soils require improving we turn the clover crop under, and repeat the operation until there is sufficient fertility to allow us to carry the clover off. A very considerable part of the cultivated land [in Central and Western New York] has never had any other manuring than this clover and gypsum, and its fertility is not diminishing."

Not only is the clover valuable as a fertilizer when turned under,

* *On Forage Crops*, by John Stanton Gould: *Trans. N. Y. St. Agricul. Soc.*, xxxii, pp. 1–90. 1878.

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but, according to Mr. Geddes: "All grain-growers that have extensively used clover as a fertilizer have thereby enormously increased the quantity of barnyard manure made on their farms."

It is asserted that crops are much less infested with weeds when the land is manured with clover than with any other form of manure.

There is no cultivated crop that leaves so large a portion of vegetable matter in the soil, after the crop has been removed, as clover.

Clover roots seek the elements of plant-life deeper than other crops. They act upon soil as sub-soil plowing.

Many pages of testimony to the value of the clover crop, from leading agriculturists in this country and in Europe, could easily be presented, but the above are sufficient for the present purpose.

INCREASE OF INSECT DEPREDATIONS ON CLOVER.

It has often been remarked that in no department of natural history can our studies ever be completed. New forms are continually presenting themselves, drawn from localities newly explored, new and improved methods of observation, and, in the animal and vegetable kingdoms, from changed conditions of environment of native species, or from importation from distant localities accompanied often by a marked change in appearance and habits. The entomologist, whose province it is, in the description, naming, delineation and classification of new species of insects, to lay the foundation for the practical application of the science, is continually finding himself embarrassed by the multitude of undescribed species which present themselves to him for name. The few economic entomologists among us, whose duty it is to study the transformations and the economy of not only the newly-described species, but even those whose histories have remained unknown for perhaps a century since their discovery, cannot but feel humiliated in the conviction of the utter inability of so few to perform the work with which they are charged, with the accuracy and the rapidity expected of them. Not only is the field of their labor increased by the addition of acquired territory, but the ground once worked, as was believed thoroughly, must from time to time be gone over anew. The list of depredators on each food-plant, and there is not one exempt from its insect pests, is being each year increased. Thus, Dr. Fitch, in his admirable *Reports of the Injurious Insects of the State of New York*, records fifty-six species depredating on the apple-tree.* To day the list could be increased one-half; and in lists of the insects infesting our principal food-plants throughout the

* Third Report, pp. 8–80. 1856.

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United States, which I have in preparation, there are already recorded as apple-tree insects one hundred and twenty-five species; when completed, by an examination of the authorities at my command, I will venture to predict that the number will approach one hundred and fifty. Only ten years ago, Dr. Packard, a writer of celebrity in economic entomology, estimated the number of our apple insects at seventy-five.*

In the paper from which I have already quoted — *Forage Crops*, by J. Stanton Gould, and which it was evidently the purpose of the author to make complete — in giving prominent places to the insects infesting the clover, only four species are introduced. In the paper now presented forty-six species are recorded. If you ask how this great increase in number is to be accounted for, the answer may be given:

By an increased knowledge of insect economy, disclosing to us their food-plants.

By change from former food-plants in their wild state to the same improved by cultivation.

By change from former food-plants to allied more attractive ones and better adapted to the insects.

By change from food-plants existing in limited numbers to others cultivated upon a large scale.

By introduction of species from other countries.

The above considerations will, in part, account for the rapidly growing lists of insect depredators upon the products of our fields, orchards, vineyards, gardens and forests. The remarkable increase of individuals of a particular species has other explanations, in other conditions, as for example:

The extension of area devoted to a special crop, whereby insect attack is invited and concentrated.

An unhealthy condition of the plant, resulting from the exhaustion of the elements indispensable to its perfect development, through continuous culture of the crop without rest, proper manuring or rotation. It would be interesting to enlarge upon these points, and illustrate them by reference to some of our insect depredators, but I will only refer at the present, to a single species, in illustration of original and wild food-plants deserted for more attractive cultivated ones.

The striped turnip-beetle, *Haltica nemorum*, of Europe, received its specific name from the localities in which it originally occurred; the name, in Greek, signifying an inhabitant of woods and groves.

* *First Annual Report on the Insects of Massachusetts*, p. 5. 1871.

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Since the turnip has become one of the principal crops in England, the striped turnip-beetle, as it is now popularly called, while still feeding on several of the cruciferous plants, as cabbage, radish, mustard, etc., will readily desert these for a field of turnips in the vicinity. An instance is narrated where great numbers were seen flying against the wind toward a large field of turnips on the brow of a hill, to which they were evidently attracted by their acute sense of smell. *

Having claimed your attention to a brief consideration of the importance of the clover crop, and, at somewhat greater length, to the increase of insect depredations upon it and other crops, I will now speak of the insect depredators.

INSECTS DEPREDATING ON THE CLOVER.

The brief time that I have been able to devote to the preparation of this paper does not permit me to present you a complete list of such depredators; it is offered only as a preliminary one. No attempt, to my knowledge, has been made in this country to compile such a list; and that now presented has been drawn up from a limited examination of the writings of our principal entomologists, and from manuscript notes kindly furnished me † That no notice of clover insects appears in the Reports of Dr Fitch, while almost every other crop of economic importance received attention at his hands, is undoubtedly owing to the fact that so very few were known to him. In Europe, they were long since made the subject of special study. Curtis, in his excellent paper on the "Natural History and Economy of various Insects affecting the Clover Crop [of Great Britain and Ireland], ‡ published in 1860, treats of eleven species occurring upon *Trifolium*, of which five are Coleoptera (beetles) and the remainder Lepidoptera (butterflies and moths). §

An extended list of the insect enemies of *Trifolium pratense* is given by J. H. Kaltenbach, in *Die Pflanzenfeinde aus der Classe der Insecten*, Stuttgart, 1872, Part 1, pp. 124–129. As nearly all the genera embraced therein are represented in this country, we quote the list for comparison with our species. For its communication and

* *Curtis' Farm Insects*, p. 23.

† I am indebted to Prof. Riley for notes upon several species not hitherto known to feed on clover.

‡ *Farm Insects*, pp. 474–516, figs. 64, 69, and plate P.

§ Curculio (Sitona) lineatus *Linn.*, Apion apricans *Herbst*, A. assimile *Kirby*, A. flavipes *Fabr.*, Coccinella impunctata, Colias Hyale *Linn.*, Lasiocampa trifolii *Linn.*, Euclidia glyphica *Linn.*, E. mi *Linn.*, Gelechia anthyllidella *Hübn.*, Coleophora deauratella *Lienig.*

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for the additional citations, I am indebted to the kind services of Dr. Hagen, of the Museum of Comparative Zoölogy, at Cambridge.

Sitones flavescens..... *Morsham.*
Sitones lineatus..... *Linn.*
Phytonomus nigrorostris..... *Fabr.*
Phy. meles v. trifolii..... *Herbst.*
Tychius pisirostris..... *Fabr.*
Tychius polylineatus..... *Germ.*
Ceutorhynchus lineatus..... *Payk.*
Apion seniculum..... *Kirby.*
A. virens..... *Herbst.*
A. flavipes..... *Fabr.*
A. fagi..... *Linn.*
A. assimile..... *Kirby.*
A. trifolii..... *Linn.*
A. gracilipes..... *Dietrich.*
A. varipes..... *Germ.*
A. apricans..... *Germ.*
Hylesinus trifolii..... *Müll.*
Labidostomis longimana..... *Linn.*
Lycæna Amyntas..... *Schiffm.*
L. Alexis..... *Treits.*
L. Ægon..... *Schiffm.*
L. Cyllarus..... *Fabr.*
L. Dolus..... *Hübn.*
L. Adonis..... *Hübn.*
L. Argus..... *Hübn.*
Melitæa Athalia..... *Esp.*
Colias Hyale..... *Linn.*
Leucophasis sinapis..... *Linn.*
Zygæna Minos..... *Hübn.*
Z. meliloti..... *Ochs.*
Z. loniceræ..... *Hübn.*
Z. trifolii..... *Esp.*
Z. filipendulæ..... *Hübn.*
Z. peucedani..... *Esp.*
Z. scabiosæ..... *Hübn.*
Z. Achilleæ..... *Hübn.*
Z. angelicæ..... *Ochs.*
Orgyia fascelina..... *Hübn.*
Gastropacha rubi..... *Hübn.*
G. trifolii..... *Hübn.*
Callimorpha hera..... *Linn.*
Orthosia litura..... *Hübn.*
O. gracilis..... *Hübn.*
Plusia gamma..... *Hübn.*
Mamestra pisi..... *Hübn.*
M. chenopodii..... *Hübn.*
M. suasa..... *Esp.*
Agrotis comes..... *Hübn.*
Episema graminis..... *Linn.*
Acontia solaris..... *Hübn.*
Euclidia glyphica..... *Hübn.*
E. mi..... *Hübn.*
Herminia crinalis..... *Treits.*
Boarmia selenaria..... *Hübn.*
Fidonia clathrata..... *Linn.*
Ortholitha bipunctaria..... *S. V.*
O. palumbaria..... *Hübn.*
Ypsolophus deflectivellus..... *H.-S.*
Phoxopteryx badiana..... *S. V.*
Gelechia tæniolella..... *Treits.*
Lithocolletis Bremiella..... *Frey.*
L. insignitiella..... *Zell.*
Acipitilus pentadactylus..... *Linn.*
Agromyza trifolii..... *Kaltenb.*
Lopus roseus..... *Fall.*
Aphis pisi..... *Kaltenb.*

In the above list, sixty-six species are enumerated. In addition to these J. Kuenstler, in *Die unseren Kulturpflanzen schædlichen Insecten*, Wien, p. 57, 1871, gives the following: *Epilachna globosa*, *Goniostena sexpunctata*, and *Agromyza nigripes*. Linnæus, in *Pandora Insectorum*, 1758, cites *Melitæa Cinxia* as an enemy to clover, and Motschulsky state that *Apion craccæ* destroys clover, in Russia.

The following list comprises all the United States species that are known to me at the present, either from personal knowledge or accepted authority, as clover insects. With perhaps a half dozen exceptions all are known, or may be presumed to occur, in the State of New York. The larvæ of the thirty-three species of Lepidoptera prey upon the

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growing clover, except that of *Asopia costalis* which attacks the clover stored in barns and stacks, and also feeds upon the dried seed.

LEPIDOPTERA.

Callidryas Eubule ..... *Linn.**
Colias Cæsonia..... *Stoll.*
Colias Eurytheme..... *Boisd.*
Colias Philodice..... *Godt.*
Terias Nicippe..... *Cram.*
Terias Lisa ..... *Boisd.-Lec.*
Terias Delia..... *Cram.*
Melitæa Editha..... *Boisd.*†
Chrysophanus Americana... *D' Urb.*
Lycæna Comyntas..... *Godt.*
Eudamus Pylades ..... *Scudd.*
Hyphantria textor..... *Harr.*
Arctia Phalerata ..... *Harr.*
Arctia Achaia..... *Gr.-Rob.*‡
Pyrrharctia Isabella ..... *Sm.-Abb.*
Hyperchiria Io..... *Sm.-Abb.*
Agrotis saucia ..... *Hübn.*
Mamestra trifolii..... *Esp.*
Mamestra renigera..... *Steph.*§
Mamestra picta..... *Harr.*‖
Leucania unipuncta ..... *Haw.*
Prodenia commelinæ..... *Sm.-Abb.*
Drasteria erechtea..... *Cram.*
Hypena scabra ..... *Fabr.*
Aspilates dissimilaria..... *Hübn.*
Asopia costalis ..... *Fabr.*
Asopia olinalis ..... *Guen.*
Asopia farinalis ..... *Linn.*
Tetralopha..... *N. sp.*
Phoxopteris angulifasciana.. *Zeller.*
Tortrix incertana..... *Clem.*
Anaphora agrotipennella.... *Clem.*
Gelechia roscosuffusella..... *Clem.*§

COLEOPTERA.

Hylastes trifolii ..... *Müller.*
(Larva in roots.)
Languria Mozardi ..... *Fabr.*
(Larva in stem.)
Graphorrhinus vadosus .....*Say.*
(Imago on leaves.)

DIPTERA.

Cecidomyia leguminicola ... *Lintn.*
(Larva on seeds.)
Cecidomyia trifolii .... *Loew.*
(Larva on leaves.)
Oscinis trifolii..... *Burgess.*
(Larva in stem.)

ORTHOPTERA.

Caloptenus femur-rubrum... *De Geer.*
(Imago on leaves.)
Caloptenus spretus..... *Thomas.*
(Imago on leaves.)
Caloptenus differentialis .... *Thomas.*
(Imago on leaves,)
Caloptenus bivittatus ..... *Say.*
(Imago on leaves.)
Caloptenus atlanis ..... *Riley.*
(Imago on leaves.)

HOMOPTERA.

Pemphigus lepidii..... *Riley MS.*
(Imago on roots.)
Thrips sp. ..... *Walsh.*
(Imago on blossoms.)

With increased knowledge of the food plants of our insects, there will undoubtedly be added to the above list several species of the Coliades allied to *C. Philodice*, others of the *Lycænidæ*, some of the *Tortricidæ*, and other Lepidoptera. Of the Coleoptera, a large increase is to be expected, as twenty species are already recorded in

*The parenthetical limitation of the authority to the species in those cases where the species have subsequently been placed in other genera — ordinarily adopted by me and given in the MS. — was omitted by the compositor from this and the preceding list, and, for reasons, has not been reintroduced. The compositor is also responsible for the departure from the MS. in the columnar arrangement of the authors' names.

† Auct. H. Edw. ‡ Auct. Stretch. § Auct. Riley. ‖ Auct. Glover.

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Europe as feeding on clover (four with us), and among them nine species of *Apion*—a genus largely represented in this country, but of which the habits of very few are known.

It would extend the list immoderately if all the grasshoppers which at times feed on clover were enumerated. Probably all the species of *Caloptenus*, of which we have in the United States about thirty accepted species, together with several other of the *Acrididæ*, include clover among their food-plants. The five Calopteni named are those whose depredations upon clover have been observed, and from their extent are deemed worthy of record.

It is proper to state that in presenting the above list, it is not offered as a list of clover pests. A large proportion of the species are not really injurious to clover; they have other food-plants, upon some of which their depredations are more frequently brought to our notice, and are of more serious consequence to us. Others, while so far as we know their history, feed solely upon the clover, yet the nature of their attack prevents it from being of grave importance.

It was my purpose to present in this paper, for convenience of reference, a notice and description of each of the above species, but circumstances have prevented this, and it will, therefore, embrace but five of the species from the above list, which are of special interest to us at the present. They have been added to our clover insects within the past three years—two by discovery and description for the first time, two by their first detection in this country, and one by discovery of its food-plant. It also adds much to the interest of these discoveries, as inciting grave apprehensions for the future, that their attacks are thus simultaneously made upon every portion of the clover plant, viz., the root, the stem, the leaf and the seed. The question forces itself upon us—is the clover a doomed plant?

Hylastes trifolii *Müller.*

(*The Clover-root Borer.*)

Müller. Mem. Soc. Dep. Mt. Tonerre, i, pp. 47–64. 1807.
Schmitt. Stett. Ent. Zeit., v, pp. 389–397. 1844.
Lintner. Ann. Rept. N. Y. St. Agricul. Soc. for 1879, pp. 41, 42, figs. *a–d.* 1880.
Country Gentleman, xliv, p. 631. 1879.
Riley. Ann. Rept. Commis. Agricul. for 1878, pp. 248–250, pl. 5, figs. 2, 3. 1879.
Amer. Entomol., iii, p. 180, fig. 81. 1880.

This species has already been noticed in the paper above cited, which was presented to the Society at its last annual meeting. In this notice I retained the generic name of *Hylesinus*, under which it was originally described by Müller. The name was adopted by sub-

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sequent European writers in treating of its injuries, and by Prof. Riley in this country. At the present time it is referred to the genus *Hylastes* by the leading Coleopterists of Europe, and this reference has been accepted by Dr. Le Conte.

It is a minute beetle, only eight-hundredths of an inch in length, belonging to the destructive family of *Scolytidæ*, usually known as *bark-borers*, from their general habitat, beneath the bark of various trees. The habit of this species as a root-borer is somewhat exceptional, and is the more notable, as a closely allied species, the *Hylesinus opaculus* Le Conte, which has been by some regarded as identical, lives beneath the bark of elm and ash trees.

Fig. 1.

The appearance of the beetle is represented in the accompanying figure, in *d*. The larva, as found within the burrows, is shown in *b;* and the pupa, formed in an enlarged cavity at the bottom of the burrow, is given in *c;* the figures are about ten times their natural size. At *a*, *a*, *a*, the operations of the larvæ are shown.

As stated in the paper referred to, the operations of the larvæ are within the roots and stalk of the plant, but mainly within the former. These are so eaten that the cutting of the clover is often prevented by the pulling up of the plant before the mower.

Our knowledge of the life history of this species is mainly confined to the paper of Müller, in which it was originally described and illustrated (by a colored plate), and another by Schmitt, several years later, giving farther information and partly reproducing Müller's paper (*loci cit.*). In addition to the biological details presented by Schmitt, which have been extracted by Prof. Riley (*loc cit.*, p. 249), the following may also be added, as of interest:

"The young larvæ, at first, by their feeding, enlarge the cavity made by their parents to the size of a small pea. They then gnaw sideways and go downward, probably because the lower part of the root offers more food and is fresher than its superior woody portion. The galleries run in nearly a straight line between the epidermis and the wood, and are filled, according to Müller, with black excremental dust. I could not observe the cast larval skins. The cradle of the

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pupa is at the end of the gallery, a little inward. Here the pupa is to be found, the head upward, at the end of September, and if the weather is favorable the image is perfectly developed in October. I saw full-colored specimens on the twentieth of October. The beetle hibernates in the root and lives probably upon the root. In the spring it ascends to the chamber in which the eggs were deposited, where, in rough weather, many specimens may be found collected. In the first warm spring days they gnaw through the head of the root or pass through the hollow stems, the pith of which has decayed during the winter."

Most of the European entomologists who mention this species quote it as a very rare one. Pfeil (*Stett. Ent. Zeit.*, vii, p. 55.—1857), states that it is not rare in forests in Eastern Prussia. Bedel (*Bull. Ann. Soc. Ent. Fr.*, Ser. v. 1876, p. clviii) gives it as his belief that its habits, while very well given by Müller, are not generally known, as M. Perris has stated (same vol., p. 175) that he had never found it on clover, and that without any doubt, its specific name was erroneous. Bedel further states that in the vicinity of Paris, as in Germany, its favorite food-plant is clover. In Bretagne and Landes, it is found on *Sarothamnus scoparius;* in Belmont (Aix), it was discovered in an old root of *Ononis natrix.* Nördlinger (*Kleine Feinde der Landwirthschaft*, 1855, p. 185) also states that prominent authorities doubt that it lives in the clover.

From the above references it will be seen that this insect has not been known in Europe as a serious clover pest. Its formidable attack upon the clover in this country is in conformity to the rule that has become established: the depredations of species introduced among us from abroad are largely increased in their new home.

The operations of this beetle were first brought to the notice of Prof. Riley in the autumn of 1878, in specimens discovered in Yates county, New York, and it has thus far proved quite destructive in that county, Seneca, Ontario and Genesee counties. A correspondent of the *American Entomologist* (vol. iii, p. 227), writing under date of July, 1880, states: "It has taken all the clover in part of Genesee county. In half a dozen clover fields examined during a ride of ten miles, every plant pulled up was found to be more or less injured by it. While most of the plants are still alive, they are of little value for hay, seed or pasture."

From Mr. W. W. Stacey, of Geneva, New York, I learn that, as a result of inquiries instituted by him, if there is less damage reported by the root-borer in Seneca county and its vicinity during the past

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year (1880), it may be ascribed to there having been less clover for it to attack; the spring of the preceding year having proved very unfavorable for clover seeding. While it appeared that the small or medium clover is less liable to the attack of the borer, than the large, the latter is the variety preferred by the seed-midge. He expresses the fear that until some parasite appears to attack these two pests, the clover crop, which has been prized as the sheet-anchor of their husbandry, must prove a failure in that portion of the State.

It is not at all probable that the ravages of this insect are confined to the State of New York, but during the brief time that has elapsed since its discovery, no record appears of its occurrence in other States.

At present we know of no better method of controlling its depredations, than the plowing under of infested fields in the spring of the second year of the clover, at which time the insect is most abundant; and, by *general agreement* throughout the more seriously infested districts, to refrain from the cultivation of clover for two, three or four years. It is believed that even the shortest period mentioned, under concerted action, would show beneficial results. Kuenstler, a German writer, suggests sweeping with a net over the clover in the spring to collect the beetles, and taking up the infested plants. Such methods would prove of very little service in our fields, where almost every plant is infested.

LANGURIA MOZARDI *Latr.*

(*The Clover-stem Borer.*)

Latreille. Gen. Crust. et Ins., iii, p. 66. 1807.
Say. American Entomology, iii, pl. 39, left hand fig. 1828.
Lamarck. An. sans Vert., deux. edit., iv, p. 486. 1835.
Melsheimer. Cat. Coleop. U. S., p. 47. 1853.
Le Conte. Proc. Acad. Nat. Sci. Phil., vii, p. 161. 1854.
Olivier. Entomol., v. p. 464, pl. 1, fig. 8.
Crotch. Trans. Am. Ent. Soc., iv, p. 350. 1873.
Le Baron. Fourth Ann. Rept. Ins. Ill., p. 181. 1874.
Comstock. Ann. Rept. Commis. Agricul. for 1879, p. 199, pl. 1, fig. 6. 1880.

Ascending from the roots, we find this beetle infesting the stem of the clover-plant so as to weaken it materially, if not entirely to destroy its life. As may be seen from the above references, this insect has long been known to entomologists, but it is not until the past year that its natural history has been worked out, and that it has been discovered to be a serious clover pest. We are indebted to Prof. Comstock, of the Department of Agriculture at Washington, for the investigation of its habits and early stages, and for the following facts in its history:

The eggs are deposited during the month of June, within a cavity

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gnawed by the parent beetle. They are thrust into the pith of the stem at a distance sometimes of nearly one-fourth of an inch from the opening. When hatched, the slender worm-like larvæ burrow downward into the stem, feeding only upon the pith, which they consume during their growth, for an extent of six or eight inches. At maturity, they measure three one-hundredths of an inch in length. They are remarkably slender in form for a coleopterous larva, their breadth being only about one-ninth of their length. In color they are light yellow, with the tips of the mandibles brown. The six thoracic legs on the first three segments are long and stout; the remaining segments are destitute of legs, with the exception of a single proleg beneath the terminal segment. The upper portion of this segment bears also two upward acute hooks or spines placed closely together. The change to the pupal state takes place within the stem at the lower portion of its burrow. The pupation is of short duration, and the beetles make their appearance in August, and continue to emerge until late in October.

There is probably but one annual brood of this species — the beetle surviving the winter, and depositing its eggs in June, after the manner before mentioned. A single example collected by me was taken in Schoharie, N. Y., on the 6th of June, 1860.

The beetle, as described by Say (*supra cit.*) is slender and cylindrical; the dark red antennæ gradually form a club of five joints; the palpi are threadlike; the mandibles are bifid at the tip; the maxillæ have horny teeth. The thorax is yellowish-red, smooth and unspotted. The wing-covers are bluish-black with a green tinge, marked with deeply impressed punctures arranged in regular series, but without impressed striæ. The thighs are pale rufous at the base; the tibiæ have a slight rufous tinge; the tarsi are dotted with dense hairs beneath the three basal joints, the third being bilobate. The venter has the three posterior segments black. Its length is usually a little more than one-fourth of an inch (.22 — .31 in.). In fig. 2 the several transformations of the insects are shown, viz.: the curved and elongated eggs, the larva, the pupa and the imago or beetle, together with the operation of the larva within the stem.*

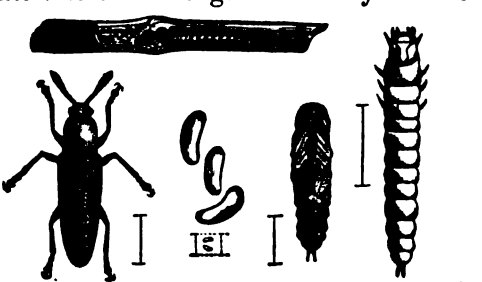

Fig. 2.

*This, and fig. 6, are from electrotypes obtained from the Department of Agriculture at Washington, through the kindness of Commissioner Le Duc.

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An excellent enlarged colored figure of the beetle is given by Say (*loc. cit.*), who figured it for the first time.

During the many years that this beetle was known only as a frequenter of flowers, no answer could be given to the query of Latreille — if it feeds only on the contents of the nectaries, to what use can the horny teeth be applied with which the jaws are furnished? Now that the habits of the beetle are known, the explanation is found in the necessity of jaws thus strongly armed to enable it to gnaw a cavity not only through the hard exterior of the clover-stem in order to reach the pith in which the eggs are deposited, but to increase the aperture to such a size as to enable it to force its whole body within the stem during oviposition, as suggested by Prof. Comstock.

This insect has been discovered working in the stems of the red clover in the District of Columbia. Our knowledge of its distribution is quite limited, but it presumably occurs throughout a large portion of the United States, for Motschulsky (*Schrenck's Reise im Amurlande*, p. 241, 1867) cites it from North America, principally in Louisiana, where it is common on cruciferous plants. In the same list, *L. apicalis* Mots — given in Harold's catalogue as a variety of *L. Mozardi* — is cited as collected in Pennsylvania. It has also been received from Kansas and Nebraska.

The species was communicated to Latreille, who first described it, by Mr. Mozard, whence its specific name.

The only recommendations that have been made for the prevention of its increase, are, the regular cutting of the clover early in the summer and again in the autumn, and not suffering waste clover to accumulate.

CECIDOMYIA LEGUMINICOLA *Lintn.*

(*The Clover-Seed Midge.*)

Lintner. Canad. Entomol., xi, p. 44 (*C. trifolii*); pp. 121–124, 1879 (ch. to *C legum.*). — Country Gentleman, xliv, pp. 455, 631. 1879.—Ann. Rept. N. Y. St. Agricul. Soc. for 1878, pp. 62–64 (*C. trifolii*).—Rept. Inj. Ins. for 1878, pp. 4–6 (reprint of prec). 1880.—Thirty-ninth Ann. Rept. N. Y. St. Agricul. Soc., pp. 37–41. 1880.—Ann. Rept. Ent. Soc. Ont. for 1879, pp. 28–30. 1880.

Riley. Amer. Agriculturist, xxxviii, p. —, 1879.—Ann. Rept. Commis. Agricul. for 1878, pp. 250–252, pl. 6, figs. 1–3. 1879.

Comstock. Ann. Rept. Commis. Agricul. for 1879, pp. 193–197. 1880.

This serious clover pest, which has caused almost complete destruction of the clover seed in several of the western counties of our State, which I first brought before your society at its annual meeting in 1879,

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and also gave you additional information relating to it in a paper presented to you at the annual meeting of last year (*loc. cit*), is again brought to your notice in order to give you further facts in its history.

While Western New York appears to be the principal field of its operations, yet during the last year it has been detected in the District of Columbia, and in both the northern and southern portions of Virginia. It will undoubtedly be found to have an extensive distribution throughout the States — perhaps co-extensive with the culture of its food-plant.

Although, in examinations made by me, I have failed to discover the presence of the larvæ in the heads of white clover (*Trifolium repens*), they have recently been found therein in considerable numbers upon the Agricultural Department grounds at Washington. At the same place the female midge was detected in the operation of depositing her eggs during the month of September. By means of her long extensile ovipositor, they were crowded down between the hairs enveloping the seed capsule of the undeveloped florets. They were not thrust within the closed florets, nor were they glued to the hairs, nor inserted in the skin of the capsule. The eggs are laid singly, but sometimes five occur in a cluster; on one flower-head fifty eggs were counted. They are almost microscopic in size — their average length being .01 of an inch, and their breadth about one-third of their length, one end being somewhat the larger. In color they are pale yellow.

Figure 3 represents, in outline, greatly enlarged, the female midge, with the four-jointed (counting the small basal joint) ovipositor extended; at *c*, a more highly magnified view of the tip of the ovipositor is given, clothed at its extremity with short hairs; *b* is a greater enlargement of the head, to show the structure of the eye, the four-jointed palpi, and the basal joints

Fig. 3.

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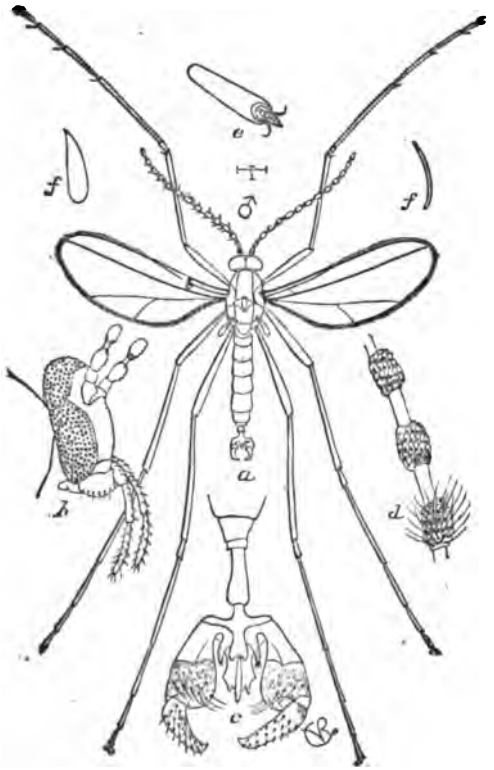

Fig. 4.

of the antennæ; *d* is an additional enlargement of antennæ joints, with their minute hairy clothing shown on the lower one. The small lines at the right, near the character indicating the female sex (♀), gives the natural size of the midge.

In Figure 4 is represented the male midge upon the same scale of enlargement as the female. Additional enlargements, to show structure, are given at *b*, of the head; at *c*, of the peculiar clasping genital organs; at *d*, of the pedunculated joints of the antennæ, which are more rounded and hairy than those of the female; at *e*, of the claw at the tips of the legs; and at *f*, forms of scales of the wings and body which are omitted from the figures.

Figure 5 represents the larva (natural size given at the right) seen from beneath, showing upon the first thoracic segment the notched "breastbone" characteristic of the Cecidomyiæ larvæ, and, as yet, without any assignable purpose. At *b*, the head is shown retracted and more highly magnified. The above figures are from drawings by Prof. Riley.

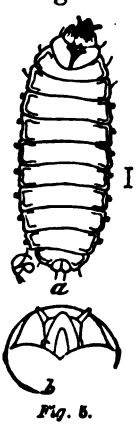

Fig. 5.

Examples of both the larva and the perfect insect, received from different localities, show quite a range in variation. The larvæ vary from nearly white to a bright orange red, and the imago from an almost uniformly colored abdomen to an ornamentation consisting of distinct rows of dark spots.

The pupa has been observed and described, and the duration of the pupa state ascertained to be about ten days.

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An interesting account is given of the emerging of the mature larvæ from the clover heads, when in readiness for their pupation, as follows: "As they leave the heads of clover the sight is an interesting one. A head, which one moment is motionless, and at a glance seems to have no animal life about it, becomes the next fairly swarming with these maggots. From nearly every closed floret one emerges and wriggles violently until it works its way so far that it falls to the ground. A patch of clover which was observed [by the narrator, Mr. Howard, upon the Department grounds] on the morning of May 13, seemed entirely alive with the issuing of maggots and their accompanying parasitic foes."*

It is very gratifying intelligence that two parasites have been discovered preying upon the clover midge, and that they give promise of rendering efficient service in checking the increase of this pernicious insect.

The first of these has only been obtained from the District of Columbia. It is a minute hymenopterous insect belonging to the same family of *Eurytomidæ* with the well-known joint-worm fly (*Isosoma hordei* Harr.), and has been described by Mr. Howard as *Eurytoma funebris*. It attacks the first brood of the midge—numerous examples of it having occurred as early as the third of May. It preys upon the larva during its early growth, and kills it before it is ready to leave the seed. The parasite then changes to its pupal state within the seed, and the perfect insect, when it emerges from its pupa, escapes from the seed through a small hole which it eats therein. The time of its appearance is a few days after the unattacked midge-larvæ have left the seeds for their pupation in the earth.

The very great aid which may be expected from this parasite, may be inferred from the statement given, that an examination of many seed-heads, made at Washington on the twentieth of June last, showed that while nearly eighty-five per cent of the seed had been destroyed by the midge-larvæ, eighty per cent of the larvæ had been in turn destroyed by the parasites, thereby lessening in fields where the same two-fold attack existed, to the amount of that per centage, the numbers of the succeeding brood of midges.

The second parasite has been identified with a species described by Dr. Fitch as *Platygaster error*, which had been obtained by him in wheat fields, but without indication of the insect which it infested. Examples of this parasite came from the farm of Mr. G. C. Snow, of Branchport, Yates county, N. Y. This species probably attacks the

*Ann. Rept. Commis. Agricul. for 1879, p. 194.

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midge-larvæ at a later period in their growth than the preceding, as the infested larvæ retain sufficient vitality to prepare for their pupation by constructing their cocoons within the earth They are subsequently killed by the parasite attack, and the matured parasite cuts its way through the cocoon and emerges from the ground.

For the above facts in the natural history of the clover-seed midge and its parasites, we are indebted to the last report of the entomologist of the agricultural department at Washington, Prof. Comstock.

There are two annual broods, and, in seasons unusually favorable for their development, perhaps three broods of the midge in the State of New York. The eggs of the first brood will undoubtedly be found, when the history of this species is entirely known, to be deposited within the hairs of the young clover heads as soon as they commence to form — perhaps as early as May 1st,— the earliest record which I find of the blossoming of the clover, in this State, being May 15–18 for successive years, in Westchester county. These eggs hatching in about ten days, would give us the larvæ which are found within the blossoms, already considerably advanced in growth, in the early part of June. Allowing for the remainder of the larval growth and following pupation, the period observed at Washington (July 2 to August 26, and July 18 to September 10,=fifty-four and fifty-five days), the perfect insect would appear about the middle of July. These again ovipositing, should produce the second brood as early as September 25*. Only a portion of the brood emerge from their pupæ in the autumn, — the remainder hibernating among the roots of the clover; and it is from these hibernating individuals that we have the flies which emerge during the first part of May, to deposit their eggs as before stated, in the forming clover-heads, for the summer brood.

In the latitude of Washington, it is believed that the species has three annual broods, but it seems difficult to determine their precise limits, as the insect, in its final stage, presents a very unequal rate of development. Hence it is that individuals of the autumn brood may continue to emerge from early September to the end of the season — all through the winter in a warm room, according to Riley — and again through the whole of May and perhaps the greater part of June, — a period extending over three-fourths of the year, for the entire exclusion of a single brood. And to this fact, also, it is owing that two broods may present to the ordinary observer the phenomena of several successive broods, as would naturally be inferred from the

* Prof. Riley states that "the flies begin to issue in September."

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recorded dates of observation of larval infested clover heads within our State, viz: early June (Albany county), June 19 (Warren county), July 2 (Otsego and Schoharie counties), July 5 (Albany county), July 18 (Yates county), August 1 (Chemung county), August 6 (Wayne county), August 12 (Yates county), August 19 (Chemung county), last of August "and later" (Yates county). From these data, it appears, that at any time within the months of June, July and August, the larvæ may be found within the clover heads.

I have no special report to offer of the depredations of the midge in Western New York, during the past year. The newly discovered parasitic aid, seems not, as yet, to have checked its operations. They are evidently increasing both in severity and in their distribution. Mr. W. W. Stacey, in referring to it, writes: "The great marvel to me is the rapidity with which the midge spreads. From slight attacks in small and scattered localities two or three years ago, in a single year, it seemed to have spread all over this region."

The recommendations made for the destruction of the clover-root borer, are the best that we are prepared to offer for the destruction of the clover-seed midge, viz.: Turning deeply under the infested fields while the larvæ are the most abundant, and cessation from the clover culture for a period of time.

Cecidomyia trifolii *Loew.*

(*The Clover-leaf Midge.*)

Loew. Verhandl. Zoöl. Bot. Gesell., xxiv, p. 142. 1874.
Comstock. Ann. Rept. Commis. Agricul. for 1879, pp. 197–199, pl. 1, fig. 5. 1880.

In my paper presented to this society, announcing the discovery of the clover-seed midge, I had named it *Cecidomyia trifolii*, and it so appeared in the publication of the paper, and in other papers. Learning subsequently that the name had been previously given to a European species, it became necessary to rename it. Speedily following this change, the European *C. trifolii* was discovered in this country. It has been studied at the Department of Agriculture at Washington, and from the last report of the Entomologist, we compile the following information respecting it.

It differs so little in general appearance from the clover-seed midge, that it can only be separated by critical examination. The principal differences given, are its smaller size, and two antennal joints less in the female (fourteen instead of sixteen).

The mature larvæ, in color, are not so bright an orange; they are

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smaller in size (.059 inch against .085 inch), and their surface is more roughly granulated.

While the two species present so great a similarity in appearance, their habits are entirely different. As indicated in the common name given it, the newly discovered species attacks the leaf of the clover. Like the two other Cecidomyiæ which infest the clover in Europe, it produces a deformation of the leaf of such a character as to bring it under the plant deformations known as galls. The gall of the species as originally described by Loew (*loc. cit.*) is as follows:

"On the undermost root-leaves of *Trifolium pratense*, the leaflets become fastened together by the work of the larvæ, so that their bent edges fit one upon the other like little pods. The leaf substance is thereby a little thickened, yellowish or yellow, with brownish specks. On the above named leaves usually but one leaflet is deformed after this manner — seldom all three. Before the midge emerges, the pupa works its way through between the closed edges of the leaf until half its body protrudes."

Loew further states that the species is not rare in the locality where it occurs, and that the midge appears at the end of June. From galls collected by him on the twentieth of June, in which most of the larvæ had changed to pupæ, he obtained the first flies on the twenty-eighth of June. The length of pupation was, at the longest fourteen days.

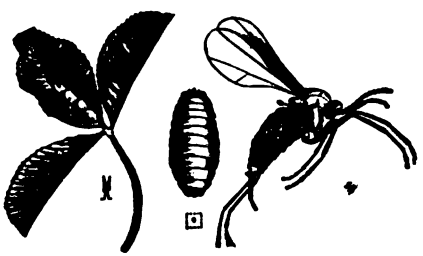

Fig. 6.

In Figure 6 (from an electrotype obtained from the Department of Agriculture at Washington) are represented the folded leaves containing the larvæ, a partially opened leaf-case showing the cocoons attached to the leaf, and the larva and female midge enlarged.

While Dr. Loew discovered the species upon the red clover, and only from two to four larvæ within a leaf, it was found at Washington upon the white clover, and in some of the leaves as many as twenty larvæ were counted. Their operations had changed the underside of the leaves which they occupied, to a yellowish or brownish and sickly appearance, and the fold on each side of the midrib was bulged out in a blister-like form. When first discovered on the thirteenth of June, larvæ were found in some of the galls; in others, their delicate, white, oval, silken cocoons, still containing their pupæ and attached to the inner surface of the galls; and in others, only the

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cocoons and their protruding pupal-cases, from which the midges had emerged.

The operations of this midge were quite common upon the Department grounds, but were not noticed elsewhere. It is scarcely necessary to state, that, from the nature of its attack upon the clover, even if it should prove to be very abundant, and of general distribution, it is not at all probable that it will ever become a serious clover pest.

OSCINIS TRIFOLII *Burgess.*

(*The Clover Oscinis.*)

Burgess. Ann. Rept. Commis. Agricul. for 1879, p. 201. 1880.
Comstock. Ibid., pp. 200, 201. 1880.

For the recent discovery of this species and its addition to the list of clover insects, we are also indebted to the Agricultural Department at Washington, and for its published history, to the last report of the Entomologist, Prof. Comstock.

The insect, in its perfect state, is a minute, hairy fly, measuring but a trifle over one-twentieth of an inch in expanse of wings, of a yellow color, with the upper surface of its thorax and abdomen, black. The wings are transparent with brownish veins. The halters or balancers, are golden-yellow, and the legs are pale yellow.

It belongs to the family of *Oscinidæ*, of which many of the species have long been known as serious depredators upon the wheat, rye and barley crops in Europe, and numerous species of which were discovered by Dr. Fitch hovering over wheat and barley fields in this State.*

In my *Report on some Injurious Insects of the Year* 1879, published in the annual report of your society for that year (pp. 45, 46), I have noticed this family and referred to several of the species which it embraces.

The larvæ of this species mine the leaves of the white clover growing upon the Department grounds, outside of which they had not been discovered. They are greenish-white, slender maggots, sixty-eight thousandths of an inch in length, tapering toward the head; their locomotive organs consist of three pairs of ventral tubercles on their anterior segments, and the terminal segment is curiously adorned with a pair of trilobed dorsal tubercles, a pair of lateral tubercles, and another pair of ventral tubercles. The minute larvæ live within the leaf, feeding upon the parenchyma, causing, in some examples, the

*For a figure of *Oscinis tibialis* Fitch, see *First and Second Report on the Insects of New York*, pl. i, fig. 5. 1856.

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separation of the entire upper surface, while in others, not over one-third of the surface is mined.

The larvæ attain their growth toward the latter part of June, when they rupture the upper surface of the leaf, and drop to the ground, into which they work their way to a moderate depth, and within an hour change to yellow-brown, oval puparia.

In less than two weeks the perfect flies appear. From the very short time required for these transformations, it is thought that there may be three annual broods of this insect.

Like the preceding species, this does not promise to be particularly injurious to the clover.

Thanking you for your attention, I will not trespass longer upon your patience by asking you to listen to additional insect details which I am sure will be better received when they can be studied from printed pages, in connection with the insects themselves, and their depredations observed upon your own farms.

[NOTE.— Since the publication of this paper in 1881, the list of clover insects given therein — forty-six in number (see page 192 of this reprint), has been extended to seventy. The additional species are the following:

LEPIDOPTERA.

Nephelodes violans *Guenée*	Riley, 1st Rept. N. Y. St. Ent., 1882, p. 108.		
Plusia brassicæ *Riley*	Id., Gen. Ind.-Suppl. Mo. Repts., p. 78.		
Heliothis armiger *Hübner*	Barrett, Ent. Month. Mag., xiv, p. 151.		
Eupithecia interruptofasciata *Packard*	Coquillet, Papilio, i, p. 57.		
Ephestia interpunctella (*Hübner*)	Clemens, Proc. A. N. S. Ph., 1860, p. 206.		
Dichelia sulfureana (*Clemens*)	Comstock, Rept. Comm. Agr. for 1880, p. 255.		
Amphisa discopunctana (*Clemens*)	Id.,	ibid.,	p. 258.
Platynota flavedana *Clemens*	Id.,	ibid.,	p. 257.
Sericoris instrutana *Clemens*	Id.,	ibid.,	p. 258.
Grapholitha interstinctana (*Clemens*)	Id.,	ibid.,	p. 254.

COLEOPTERA.

Lachnosterna serricornis *Le Conte*	Webster, Amer. Nat., xvi, p. 746.		
Colaspis brunnea *Fabricius*	Id.,	ibid.,	p. 746.
Diabrotica longicornis (*Say*)	Forbes, 12th Rept. Ins. Ill, pp. 21, 23.		
Diabrotica 12-punctata (*Olivier*)	Id.,	ibid.,	p. 104.
Tenebrio molitor *Fitch*	Fitch, Trans. N. Y. St. Agr. Soc., xiii, p. 376.		
Macrobasis unicolor (*Kirby*)	Webster, Amer. Nat., xvi, p. 746.		
Epicærus imbricatus (*Say*)	Id.,	ibid.,	p. 746.
Sitones lineellus (*Gyllenhal*)	European authors.		
Sitones flavescens (*Marsh*)	Id., (Kalt. et al.).		
Phytonomus punctatus (*Fabricius*)	Riley, Amer. Nat., xv, p. 750.		

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HEMIPTERA.

Pœcilocapsus lineatus (*Fabricius*)..... Lintner, 1st Rept. N. Y. St. Ent., p, 277.
Limothrips tritici (*Fitch*)..... Id., 1st, 2d Repts. Ins. N. Y., p. 304.

NEUROPTERA.

Smynthurus hortensis *Fitch*..... Fitch, 6th–9th Repts. Ins. N. Y., p. 189.
Smynthurus arvalis *Fitch* ..... Id., ibid., p. 191.

It may also be of interest to state, that, in the above paper (page 189 of this reprint), it was predicted that a full list of apple-tree insects would approach one hundred and fifty species. At the present time, one hundred and eighty species are known and recorded. — J. A. L., *December*, 1883.)

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HUNGARIAN GRASS.

Essay presented and read at the Annual Meeting of the New York State Agricultural Society, January 18, 1882.

BY E. LEWIS STURTEVANT, M. D.,
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To the student of agriculture it always seems surprising to find that plants of acknowledged value have been for such a long time unappreciated, and to observe the difficulties which have usually stood in the way of the general adoption of each new product. We might instance the potato, which, known in the latter part of the fifteenth century, is scarcely recorded as introduced to Europe in the sixteenth century, had received universal distribution in the seventeenth century, and yet did not become an object of general field culture until the eighteenth century. The tomato, now so universally grown, although known as early as the discovery of Mexico, was yet only attaining a general popularity in this country as late as 1845. In these illustrations, we have, however, a human food, and it may be argued that our tastes either required a long time to be educated to a liking, or that the eatable portions, whether tuber or fruit, required to be developed to a quality which was suited to our tastes. We have the maize plant, whose value as a grain was known to the aborigines and whose fodder was used by the colonists in feeding their stock, whose value has been proved by analysis and by practice, and yet it is but a few years ago when an acrimonious discussion was taking place in regard to its general culture as a fodder crop, and its value as yet is scarcely becoming appreciated to the extent which the future will develop.

In fertilizers we have another illustration. Their value approved by theory and by practice; of slow introduction into a new region, and yet their use always increasing out of proportion after years of trial. In the one State of Georgia, in 1874, 1875, four thousand eight hundred tons were sold, at the present time over one hundred thousand tons; used by a farmer for a few years, their continuation found indispensable for increased products; and yet despite all the facts which have been alleged, their advocacy constituting a ground

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of suspicion with many, that the advocate has an interested object, a popular opinion among the farmers being that manure must be praised and fertilizer only advocated as a necessary evil, if advocated at all.

The causes of these things are not far to seek. It is only as the farmer gets skilled in use that he is enabled to gather the benefit which is expected. Scarcely a new plant or a new material to be used, but that something is requisite to be learned in order to obtain a successful issue. The man who uses fertilizer one year and finds no profit, prefers to anathematize the material rather than himself. The man who keeps using fertilizer until he has become educated to its uses, is able to look back and determine the causes of his past failures, to be avoided in the future. It is this readiness to measure new materials by old standards of measure which stands in the way of progress, and which a general education of the farmer is in the future to in a measure overcome. The same remarks apply to feeding cattle; a new material at first may be fed at a waste, at a loss, or even to an injury. We may seek example from cotton-seed meal, a food of good value to the dairyman especially, which seems peculiarly suited toward the promotion of the milk flow, and which in localities where its use has been adhered to for some time is come into universal use. Its history in eastern New England may be given briefly and pointedly. A few years since it came into the market — was bought extensively — was productive of so much injury to the cows to which it was fed, that a sudden revulsion of feeling toward it took place, and there being no purchasers it ceased to appear in the market. After a period of rest, a new trial, under the auspices of previous experience, took place, and its use is now rapidly extending. It is becoming recognized by the better milk-farmers that the cause of the former distrust was the feeding rashly a very nutritious food, and that all that was necessary to make the use of cotton-seed meal profitable and advantageous, was to feed it judiciously and in the proper quantity. The blame of the former failures is to be adjudged to the farmer, not to the food, and a further progress in farm education, the education of practice, has now made this evident to many.

And these preliminary observations bring me to my subject—Hungarian grass — a crop toward which there is considerable difference of opinion coming from the various personal equations of the farmers. By some it is be-praised, by others it is be-littled or condemned. If

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we turn to the chemist we find great value, a value equal for feeding of one and a-quarter times that of good hay. Thus analysis show:

	Timothy hay average of nine analyses.	Hungarian grass average of four analyses.
Water	13.50	16.7
Ash	3.87	5.77
Albuminoids	6.16	7.63
Fibre	28.94	28.14
Nitrogen-free extract	45.85	40.28
Fat	1.68	1.48
Or water-free:		
Albuminoids	7.11	9.16
Fat	1.94	1.77

Or if we take the extreme variation in the analysis we have:

	Timothy hay. Average of nine analyses.	Hungarian grass. Average of nine analyses.
Water	12.30 — 14.30	16.70
Ash	3.22 — 4.60	4.28 — 7.17
Albuminoids	4.88 — 8.37	5.72 — 10.67
Fibre	25.30 — 32.81	27.30 — 28.94
Nitrogen-free extract	43.29 — 48.10	34.85 — 42.40
Fat	1.08 — 2.00	1.30 — 1.70
Or water-free:		
Albuminoids	5.69 — 9.57	6.87 — 12.81
Fat	1.25 — 2.33	1.51 — 1.70

If we ask intelligent farmers for their experience, one will say the equal to hay, another that where a herd is giving ten cans of milk (85 qts.) on hay, they will give eleven cans (93 qts.) if changed to Hungarian; another says it is of little value, for cattle will not eat it, and yet another says it is not healthful especially if fed to horses. In my own experience it seems fully equal in feeding value, to the best of hay and sometimes I think it superior.

It is with these statements in mind, all of which I deem truthful and accordant with the fact in each case, that we are to meet our subject.

BOTANY.

Hungarian grass is a true grass, with hollow stem, alternate leaves, a dense spiked panicle for inflorescence, or apparently a cylindrical

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spike, and of annual growth. It belongs to the genus *Setaria*, and forms a variety of the species *Setaria Italica* Kunth, to which the specific name *Setaria Germanica* Beauv., is applied. It presents two leading varieties differing in the main in the color of the heads, the *Hungarian* with blackish heads, and the *Millet* with green heads. Other varieties have been produced by selection and culture, to which the names *golden millet* and *mammoth millet* are applied. In the latter variety, in favored localities, Professor Beal says the spikes will attain a length of fifteen inches or more. This variation into such rank growing varieties is of interest as establishing the character of the species under cultivation. So divergent are the varieties that may be produced, that in Mysore, three species adapted to different circumstances of soil, are grown, one called *bili* on watered land, another called *Kempa*, in palm gardens, and a third called *mobu*, in dry fields. In more Western India, other varieties are grown such as *ghedu*, *jotu* and *dodu*. The variety known by us as Hungarian grass, if grown thinly, forms a leafy, rather coarse grass, seldom exceeding two feet in height. If grown thickly, the internodes become elongated, and the whole plant takes on a finer character of stem and leaf, and attains a height of three feet, often of three and a-half feet. These two variations brought about by thickness of sowing afford a fodder of different values. The coarse form is less readily eaten by stock, is less relished and appears less nutritious than the finer form, and the crop may not reach half the weight per acre as the other. In favorable seasons the same description applies to the green variety known as Millet, and I can see no noticeable difference between the two kinds as an agricultural crop; but in unfavorable seasons I have a strong suspicion that the Hungarian variety is the better. Either variety is of rapid growth if planted after the earth and air have become warm, and will mature sufficient to cut in forty days from the sowing, rarely taking forty-five days in this region. The plant moreover seems to feed upon the upper layers of the soil, and to be almost indifferent to such droughts as occasionally inflict the farmer in my locality during its season of growth. I was once unwilling to believe the evidence of my own eyesight when I saw it germinating when sown on a surface-dry, dust-dry field, and flourishing right along with infrequent showers, to a heavy crop.

The History.

Setaria Italica, Kunth, or *Panicum Italicum*, L., is a native of the East Indies, and has long been cultivated there as a bread grain, and for this purpose it is held now, as in the past, in high estimation,

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more, indeed, says Ainslie, than any other grain. Drury says the Brahmins, as well as all classes of natives, particularly esteem it. The flour from the seeds is made into cakes, into pastry, for which purpose it is said to be scarcely inferior to wheat, and is used in porridge. Its Sanscrit name *priyangu* and *kangu*, in Tamil called *tenney*, in Bengalee, *cungnie*, in Telinga, *coraloo*, in Hindustanee, *kora*, in Cochin China, *cay khe*, in Malay, *navaria*, in Arabic, *dukhn*, in Persian, *arzun*, in Ceylon, *tenna-hal*, in African, *kassob*. It is cultivated as a grain in Southern Italy and occasionally in Southern Europe, and was known to the Greeks by the name of *helumos*, and to the Romans by the name of *panicum*. The leaves and stalks are still used in this region as a fodder for cattle. In France it is called *panis d'Italie* or *millet a grappe*, or *millet des oiseaux*, and the variety *Setaria germania* is said to have been introduced in 1815, as a forage grass. It is not grown in England, as the climate does not seem adapted to a plant of warm and dry regions. It seems probable that the first introduction of Hungarian grass into America, was through our Patent Office seed distribution, in 1854, although "millet" was grown by Jared Elliott, in Connecticut, prior to 1747, the grain "of a yellowish color and of the bigness of turnip or cabbage seed," and used as a forage plant. In 1822 there is a record of three tons of hay and thirty and one-half bushels of seed millet produced in New England, and in 1823, John Hare Powell, President of the Pennsylvania Agricultural Society, is reported to have sown five bushels of seed on four acres of land, and to have harvested four tons of millet hay per acre, and since then mention of millet grown for forage is occasionally to be found in are newspapers and official publications.

In 1857 the culture of Hungarian grass for fodder was scarcely known in Massachusetts, the reports indicating but experimental plots. In 1869 John Stanton Gould says that Hungarian hay formed the fodder supplied at the St. Louis stock-yards, but neither he nor other writers in the general run of newspaper articles indicate a general culture or a general knowledge of this forage plant, although a knowledge of its existence is very generally diffused, and taking the whole extent of the country, considerable quantities are grown.

AGRICULTURAL PECULIARITY.

The agricultural peculiarity of this plant is its power of withstanding drought, its intolerance of cold or continued wet soil, its rapid growth and its very large cropping capacity. By some it is said to flourish in poor soil, but this is a mistake. Being a shallow feeder,

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when first planted in a field it occupies with its feeding roots the surface layers of the soil and thus garners the fertility which plants of a different rooting habit have been unable to appropriate. Let Hungarian grass follow itself in continuous culture and the fertility being removed from that region of the soil which is required for the successful growth, but small crops will result. It is called by some an exhausting crop. This objection applies to all crops that have nutritive value. The clover is an exhausting crop in this sense, but as the clover crop removes fertility from the lower layers of the soil, fertility beyond the reach of other crops, its exhausting quality becomes masked and it is termed renovating. The Hungarian, on the other hand, removes the fertility from the upper soil from just that region which is required to be rich in order to secure the early growth from farm seeds of any crop, after germination takes place, and hence what it has taken from the soil is immediately measured by the succeeding crop, and becomes evident in excess of the quantity that has been really removed.

The intolerance of cold is shown so readily by this crop that it requires special mention. Under successive hot days and nights during its forty days of growth, the plant pushes forward continuously and with rapidity, and if closely sown may acquire a height of thirty-six to thirty-eight inches before the seed spike appears. If, however, when the plant is about eighteen inches high, a cool night or a cool period intervenes, the rapid growth is changed and the seed spike at once appears, and the crop is diminished greatly, for the appearance of the bloom marks the completion of growth extension. Hence the avoidance of early planting is requisite. The seed should not be put under the ground until settled warm weather, in my locality from June 20 to July 21, or even later. But these dates I prefer, as the harvesting of the crop; this falls within the dry time of August when rain other than showers is not generally anticipated, and a time, moreover, when the labor of the farm is more manageable than at some other times.

Its power of withstanding drought probably comes, but experiment is required to prove this, from the small evaporation from the leaves of the growing plant. This, if it be a fact, accounts for the difficulty in harvesting. Hungarian grass is one of the slowest crops to wilt and dry that I know of. I have never known a period so favorable to hay getting as to enable this crop to be harvested in less than three days of serious work, and I usually count upon four days elapsing between the cutting and the hauling to the barn.

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The rapidity of its growth, the quick extension of its roots, the season in which it is grown, all tend to make this crop conservative of manure or fertilizer to a remarkable extent. The changes are so rapid during growth that the effect of the manuring is at once evident. If, as I have observed, dung be used and forked on the field from a cart, the grass appears before harvest, hummocky, the portion over each lump of manure being taller than the intervening portions. If fertilizer be distributed broadcast from a machine, and if through careless driving the *spread* laps, the grass will grow taller over the lappings and a wavy field will result. If the fertilizer be broadcasted evenly the surface line of the growth is level and almost like a floor. These facts, there is no need of adducing others, show clearly that the Hungarian grass utilizes immediately the manure that is applied and is a crop that will repay most ample manuring. It is in fact a good farmer's crop, not a poor farmer's crop. I know of no crop more desirable for the purpose of the experimenter upon the value of manures, as its response is so invariable to quantity and quality, and the rapidity of its growth tends to diminish the action of some otherwise disturbing causes.

Under favorable conditions of climate, in the presence of sufficient fertility, the cropping capacity is so large that it seems almost unwise to make any statement. Year before last, after making every possible allowance for error, I could not calculate my yield at less than four tons per acre. This year the crop was still larger, from somewhat under six and one-half acres I hauled to the barn twenty-nine and one-half of as large loads as could be put upon the carts, and each load apparently larger than an experimental one sent to the neighboring scales for weighing some years since and which bore down somewhat over a ton. Had however a chilly night in July intervened, I should not have been able to have reported over half this enormous crop. This grass lies closer when dried than does hay and a ton does not occupy so much space in the mow as does hay. To obtain such a crop heavy seeding is a requisite. I use five pecks of seed per acre, and I am doubtful whether not to use six pecks next season. Heavy seeding crowds the plant to such an extent that the stems have to grow long and fine, and likewise the leaves, and the hay made therefrom is fine, free from woodiness of fiber, this year to my surprise, possessing a faint smell of coumarine, and is extremely relished by cattle, both cows and calves, and liked also by horses.

Earliness of cutting seems essential to the best results. If allowed to ripen the seed, the stems get quite woody, and in one instance at

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least my cattle would scarcely touch it in this condition. I have usually waited for the general appearance of the seed-heads before mowing, but this last season I commenced to cut when the seed-heads were just here and there appearing in the field, and the grass measured thirty-four inches tall. The result has been that I never saw any forage plant better relished by stock, and my man, who has always shown a prejudice against this crop on account of the labor involved in its harvesting, of his own accord volunteered the information that the cows were eating less of it than they would of hay, were increasing their milk yield, and were gaining in weight. This early cutting may account for the fragrance in this hay this year, which I had never hitherto observed, the usual smell having been — well I can hardly say sour, nor can I say sweet, rather of a negative character. The labor of harvesting is an annoyance in such heavy crops, my pair of 1,200 pound horses could go but a short distance with the mowing-machine without stopping to rest, and a man had to follow the cutting bar to keep it clean, and as it was, the machine broke in the last half acre, which had to be cut by the scythe. Then the crop did not dry the first day sufficiently to rake, the second afternoon was brought into winrows and left, the third day cocked in the heat of the day, and the fourth day the cocks partially opened and a little later carried to the barn. I omitted to state that the crop was in different degrees of maturity so that only sufficient was cut at a time to involve a steady day's work.

Feeding Value.

When I come to speak of the feeding value of this crop I must proceed with caution. So much depends in the first place on how the crop is grown. If grown from thin seeding, I can believe the testimony that it is not the equal of hay, for such has been my experience. The coarse, leafy fodder is neither relished, nor does it seem very nutritive to stock. If allowed to ripen its seed (and unless great care is taken, so rapid is the maturation of Hungarian grass, this will take place), the stalks seem to become woody and are not readily eaten by cattle. So my experience here leads me to give value to the testimony of those who give their experience without recognizing the causes upon which their particular experience depend. If the crop be thickly grown and early harvested, it is so relished by animals that I can well accept the testimony of those who have used it in this condition, and have given very favorable reports. To such as know it in this state, and who report it injurious if fed to excess, I can readily receive their

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statement of its producing injury to horses, less perhaps to cattle, but I am as yet uncertain whether the injury does not arise from the overfeeding, rather than from any innate quality of the hay. So nutritious does analysis show this hay in its best state — twelve per cent of albuminoids to the nine contained in the best timothy hay, both calculated free from water — that I am prepared to believe that injudicious feeding of Hungarian grass might have an injurious effect as a similar overfeed of grain. Thus we are brought face to face to a reasonable explanation of the reasons for the divergencies of opinion as to its value and effects, which was alluded to in the commencement of my paper. In difference of quality of Hungarian grass under difference of methods of growth and custom of harvesting, we have a just reason for difference of opinion in judging of its action and rank as a crop for winter feeding.

This crop, so it seems to me, offers another illustration of the causes which act to prevent oftentimes the rapid and extensive adoption of a new thing by the farmer. Until the farmer has found out by experience the condition under which the crop must be grown to possess value, it is not to be expected that he shall attain an encouraging success with a crop differing in habit of growth, and requiring different treatment from what is customarily given to grasses and forage crops. It is only here and there that success is met sufficient to encourage continuance; and the bother of an annual grass requires a large compensation to encourage an extended culture, and even after these conditions are fulfilled, the problem of feeding remains.

I would offer the suggestion that if Hungarian hay be possessed of the highest value, *i. e.*, from heavily seeded and fertile fields, and early harvesting, the feeding of it might be experimented upon on the principle that it is bran or grain. As a rule, farmers who are judicious do not attempt the feeding of clear bran or clear grain without the addition of forage. If now the farmer should feed Hungarian hay on the same principle as he does his grain, as an addition to other forage foods, my own experience leads to the belief that he will find it economical and of great advantage. It is not often that more than two tons of hay per acre is obtained from the best land, while the same land which will yield two tons of hay, should be expected to possess the fertility equivalent to a crop of four tons of Hungarian, of as good, certainly, probably better, feeding value than the hay.

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Rotation.

From the rooting character of this plant, a character which calls upon the upper layers of the soil, theory would justify the recommendation not to grow it too often on the same land. The principle I am trying to carry out, so far as my limitations allow, is a five years' course of cropping my land. Corn one year — Hungarian, and after the Hungarian an August seeding to grass alone, then three years of grass. On some fields the sod is turned under after the grass is mown, say July first, the land fertilized and seeded with Hungarian, and after the Hungarian is harvested, immediately seeded with grass. My calculations thus far have been answered favorably by the results for three years, but I have not as yet practiced this method throughout a rotation, as growing Hungarian in quantity has been only carried forward for two seasons as yet. On the gravelly loam soil that I possess, this use of Hungarian as a catch crop seems very encouraging. To offer the figures of the field longest under course: The first year eighty-one bushels of shelled corn with about four tons of stover grown on six bags of Stockbridge fertilizer; the second year, one ton of bone-dust applied and four tons of Hungarian; the third year, one ton and three-quarters of hay; the fourth and fifth years results to be determined in the future. I would say that on my soil a ton and a-half is usually considered a maximum crop of hay, a crop which depends as much upon the wetness of the season as upon the fertility. The season this year was very propitious for hay, and the crop responded equal to expectation. If I may be proved not always consistent in my practice, with my theory, I would submit that my farming is in certain aspects experimental, and after I have proved a problem to my satisfaction, I am sometimes apt to take up another.

Relationships.

The practical problem of farming is one largely made up of relationships. It is not so much the cost in details, as it is the profit upon the whole. The question of fertilizer is not so much what the fertilizer will cost, as it is how much the crop is worth which the fertilizer will produce. Under circumstances where hay finds quick sale at twenty-five dollars a ton, a yield of four tons of Hungarian which can be fed, or which shall release four tons of hay for sale, justifies the expenditure of forty dollars an acre for a ton of bone-dust. As the bone-dust is not all removed, but only a portion in the crop of Hungarian, and as the bone-dust is expected to carry the crops of four or five years, this expenditure for

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fertilizer becomes far less extravagant. As a matter of theory, if the fertilizer and the Hungarian hay just balance the account, there is no loss possible, for the three years of grass afterward, without additional application of fertilizer pays a profit, and leaves a balance of the applied fertility to enhance the future cropping capacity of the land.

Let us theorize a little. One thing may be accepted now as proven. There is no loss of phosphoric acid through leaching or drainage under circumstances of actual farming. Whatever phosphoric acid is applied to the soil must sooner or later, as it becomes soluble, be returned in the crops. As to how long we shall be awaiting the return may be a subject of speculation, varying in each assumed case, but as we have charged the whole value to a four years' crop, this question of "how long" need scarcely be considered in this connection. According to our tables of analysis, timothy hay contains 3.87 per cent of ash, Hungarian hay 5.77 per cent of ash. Four tons of Hungarian hay removes the first year 460 pounds of ash. A ton and a-half of timothy hay for three years is four and a-half tons in all, removing 348 pounds of ash. According to Wolff's tables, the ash of timothy removes 10.8 per cent of phosphoric acid, and the ash of Hungarian grass 5.4 per cent of phosphoric acid. We hence have for the phosphoric acid removed by the Hungarian, twenty-five pounds, for the phosphoric acid removed by the hay, thirty-eight pounds, or sixty-three pounds in all. A ton of bone dust contains on the average not less than 440 pounds of phosphoric acid. Hence by our course we have charged the whole 440 pounds to one rotation, have utilized sixty-three pounds and have presented to future crops 377 pounds.

This, however, is but a partial view of the case as presented, but it suffices for illustration.

As the growing of excessively large crops of Hungarian, or indeed of any crop, requires the heavy enriching of the soil, I may be pardoned if I offer a few reflections upon the general question of the use of fertilizer. If a farmer can afford the immediate investment of capital in his land, it will pay him sometimes to use fertilizer in quite a large quantity, more indeed than the immediate necessity of the crop shall seem to demand. In experimenting with bone dust I am governed by the following considerations. There is a certainty that phosphoric acid is never lost from the land. There is a probability that its influence upon root development indirectly leads to conserve the nitrogen supply of the land by converting it into organized material, which in turn by decay shall furnish it to succeeding crops. There is no evi-

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dence in my own experience, or in that gained by reading of the experience of others, that small applications of bone dust have often given satisfaction. It is a fact that it is the soluble material of the bone which determines its immediate cropping capacity. If we assume that bone dust is capable of affording one and one-half to two per cent of soluble phosphoric acid to the soil, 500 pounds of bone dust only offers from seven and one-half to ten pounds of phosphoric acid for plant food, not sufficient, if we consider that the distribution cannot be uniform, to show much effect on the crop. If, however, we apply 2,000 pounds of bone dust, then we have from thirty to forty pounds of soluble phosphoric acid, and again also in its better distribution a sufficient quantity apparently to show effect on a growing crop. A ton of bone lasts according to this supposition from eleven to twelve years in the soil. I only offer this as a supposition, as we have not the necessary data, so far as I know, to apply accuracy of reasoning to this problem.

The same line of reasoning applies to other materials than bone-dust, but I have selected this well known fertilizer as a convenient illustration.

In the handling of fertilizers on the farm there is much in the knowing how. As the knowledge here increases, their effect will be found more certain and more valuable. The man of study can lay down the principles, but the man of action must adopt these principles to his own position. We must drop the idea of comparison and study the subject of profit. Whether fertilizer be better or worse than home supplies is foreign to the farmer's concern. Whether fertilizer be cheaper to buy than dung is his concern. Whether purchased fertilizers add to the profits of the farm is a true question, and to what extent their purchase is justifiable, if at all, is also his concern. The personal equation can never be avoided in seeking for the causes of success or failure, and this question must be discussed by the farmer, and become realized, in order to have farming stand in the most desirable position. Our greatest hope for the future is in changing this personal equation for the better rather than by supplying definite directions or laying down empirical rules.

Summary.

Returning to our subject, we offer the following conclusions which appear to us proper and reasonable:

1. Do not sow Hungarian grass seed until the weather has become settled warm.

2. Sow it on fertile land, well prepared with a friable seed bed.

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3. Sow thickly, certainly five pecks per acre.

4. Cut promptly as soon as the seed-heads can be seen generally over the field. It is probable that delay in cutting will work more injury than would an ordinary shower, but what injury a rain storm would accomplish it rests for experiment to determine.

5. Feed in combination with other fodder rather than by itself.

6. Satisfy yourself by close observation of its true value to yourself and under what relationship it can best be grown on your farm.*

* GENEVA, N. Y., *December* 21, 1883:—After reading over the above, I see from further experience no reason to change my expressed views except to add that I have been unable to obtain the same success on heavy clay soil as I was wont to obtain on light gravel or sandy loam soil.

E. L. S.

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INJURIOUS INSECTS, WITH SPECIAL NOTICE OF SOME NEW INSECT PESTS.

A Paper read before the New York State Agricultural Society, at Elmira, September 13, 1881

By J. A. LINTNER, State Entomologist.

It is the province of the Economic Entomologist to study the insect world in the relations its various members bear to the pursuits and interests of man. It belongs to him to obtain such knowledge of their habits as to enable him to indicate those which are injurious and those which are beneficial; to ascertain the nature of the injuries and benefits, and to point out the best means to prevent the one and extend the other. This simple statement of duty embraces a line of study so great in its extent and comprehending such infinite details, that, to the advanced student, the field seems illimitable. The immense number of species with which the entomologist has to do is an embarrassment to him. Their aggregate exceeds that of all the other classes of animals combined. Their habits are exceedingly varied, and the larger number of them present themselves for study to the student under four different stages of existence, viz., the egg, the larva, the pupa, and imago or perfect insect. The number of insects in the world has been estimated at five hundred thousand species. Probably fifty thousand species occur in the United States. Very many of these, however, are not injurious from an annoyance directly to man or the domestic animals, or from their depredations upon useful vegetables. Some species are decidedly beneficial in destroying other noxious insects, or in acting as scavengers. Some find their food in plants and trees after their death. Others feed on useful plants to an extent not proving injurious, and still others exist upon material which is of no service to man or to animals used by him. I could readily give you a list of noxious insects, commencing with the Rocky Mountain locust, chinch-bug, cotton-worm, Hessian fly, wheat-midge, Colorado potato-beetle, army-worm, grape phylloxera, codling moth, plum curculio, and extending to a hundred species, all of which have shown themselves to be so injurious, and of which so much has been written, that their names are as household words,

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and would be familiar to each of you. The United States species known to us at present, as really noxious, will probably not much exceed five hundred in number. The life-history of many of these is known, and the economic entomologist has been able to point out methods by which their ravages may be, to a great extent, prevented. It is seldom that a species does not present a vulnerable point of attack in one of its four stages; and in several of those cases where no effectual means of prevention or destructon is as yet known, as the rose-bug and some of the blister-beetles, it may be ascribed to ignorance of some of the earlier stages which have thus far eluded our study. Certain it is, that only when the entire history of a species has been worked out in each of its stages, are we prepared to make recommendation of the best means of preventing its injuries.

That the labors of the entomologist are not to be confined to those commonly known as injurious, or even to those of his own country, is plainly taught by the developments of each year. An insect harmless to-day and hitherto, may the next year — from a sudden and inexplicable increase in numbers, or within a few years, from its change from some worthless wild plant to a valuable cultivated one — became positively injurious. It is safe to assert that not a single year passes without some new and interesting phase of insect injury presenting itself for special study.

It may appear under one of the following phases: 1st. As previously unknown by name and in perfect form, as with the clover-seed midge (*Cecidomyia leguminicola*) in 1879. 2d. As known, but never before recorded as injurious, as in the pyralid web-caterpillar (*Eurycreon rantalis*) in Kansas, in 1879, and the vagabond Crambus (*Crambus vulgivagellus*) during the present year. 3d. By the detection for the first time in this country of well-known European species, as the carpet-bug (*Anthrenus scrophulariæ*), its ravages observed in 1872, but not identified until 1876; the clover-root borer (*Hylastes trifolii*) in 1878, and the punctured leaf-weevil (*Phytonomus punctatus*), also the present year. Within the last three years there have been added to our list of clover depredators, no less than five species, which, attacking the plant in root, stem, leaf and seed, threaten to arrest the cultivation of clover in Western New York, where it has been regarded as almost an indispensable agent in husbandry. Four of these new clover pests were treated of in a paper presented by me at the last annual meeting of your Society. At the present time I will ask your attention to three new injurious insects, two of which have been brought to notice the present year, the other, two years ago. The first is a grass depre-

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dator, the second attacks the clover, and the third is a general feeder on garden vegetables, weeds and other plants.

The Vagabond Crambus — *Crambus vulgivagellus* Clem.

On the 18th of May last, letters were received by me from Potsdam, St. Lawrence county, N. Y., announcing a formidable invasion of the pastures and meadows of several towns in the county by the "army-worm." The ravages had only been observed during the preceding ten days, but already had they become so serious that many extensive pastures had been completely ruined. The entire destruction of the pastures and meadows was threatened, and serious detriment to the dairy interests of the northern counties was anticipated. My advice was solicited as to the best means of arresting these ravages. I had never witnessed an army-worm invasion, fortunately of rare occurrence in the State of New York, and therefore, on the evening of the reception of the above information, in company of the secretary of your Society, I hastened to the infested locality.

Three days were devoted to an examination of the ravages committed, and the habits of the depredators in several of the towns of St. Lawrence and in portions of adjoining counties. The reports had not been at all exaggerated. The destruction was serious in character, and widespread. In Potsdam, St. Lawrence county, and vicinity, every farm was infested, and it was reported from every town in the county. I observed it in Jefferson and Oswego counties; it was reported to me from Hamilton county, and it doubtless occurred in the intervening counties of Herkimer and Lewis, and also in Franklin and Clinton counties — in all, eight of the northern counties of the State. Throughout this region, many hundreds of acres of pasturage in the aggregate had been destroyed. In several old pastures examined by me, the grass had been so completely eaten that their aspect was that of having been winter-killed. A field was shown me upon the Raquette river which I could not convince those with me that it had not been winter-killed, until, upon parting the dead grass of the preceding year, I was able to show the new growth of the present season closely eaten down to the surface of the ground.

Perhaps I can best give a correct idea of the seriousness of these injuries by stating that an upland pasture examined by me in Potsdam, containing fifty acres, which, as I was informed, had ten days previously presented good pasturage, was now entirely brown. No grass could be seen in glancing over its whole extent, except over a narrow strip which had been used as a roadway when farming purposes necessitated

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occasional passing from one field to another. This from some unknown cause, had escaped attack and remained green. Upon stooping down and carefully examining the surface, amongst the sorrel and other weeds which had not been eaten, an occasional blade of grass, overlooked by the caterpillars, could be discovered, averaging perhaps one blade to the square yard — so completely had the grass been destroyed. Hundreds of dead and dried, or nearly dead larvæ, attached to stems and stalks of weeds of last year's grass, at a height of from six to twelve inches above the ground, could be seen at one glance of the eye, by placing the head near the ground and looking over the field. It is believed that most of these were victims to starvation and not to parasitism as at first thought, for no parasites were subsequently obtained from a large collection made of them.

Several interesting features characterized this attack. It was in most instances observed first on upland and old pastures, differing in this particular from the invasion of the northern army-worm, *Leucania unipuncta*, which ordinarily commences on low grass lands, working thence upward.

The progress was remarkably rapid. A brown patch first observed in a pasture would rapidly increase in area, often embracing the entire field in from ten to twelve days. Whether this was the result of the spreading of the larvæ from certain points where the eggs had been deposited, or of an unequal hatching of the eggs distributed over entire fields, as influenced by various conditions of warmth, moisture, etc., I could not ascertain, for the brief time allotted to my observations did not permit of the detection of the eggs or their empty shells.

The secrecy of the depredations was unusual. The extension of the infested area could be observed from day to day, yet few persons had seen the larvæ, and fewer still had witnessed their feeding. They were for the above reasons, probably, believed to be nocturnal feeders. An informant who had observed the movement of a blade of grass, which, retaining its attachment to the root, had its tip bent downward and carried into a hole in the ground, inclined to the belief that most of the feeding, and all of that done during the day, was subterraneous, the larvæ gradually drawing the blade into its concealed retreat as it fed upon it. Objections to this theory are found in that the grass was usually eaten closely down to the crown of the root, and that holes in the soil leading to such retreats were not seen.

In two instances, as narrated to me, immense numbers of the caterpillars were observed, in assemblages so large as to give countenance to the prevalent idea of an army-worm invasion. In both cases they had

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collected about the base and upon the trunk of a tree (a maple and an oak), to the height of two or three feet above the ground. They not only entirely covered the surface, but were piled upon one another so that, as stated, they could have been scooped up by handfuls. This occurred at Potsdam, three days previous to my visit to the place. That I might, if possible, verify these statements, I visited one of the localities on the farm of Mr. L. D. Partridge, upon an island in the Raquette river. The caterpillars had evidently been here in force, for all the grass was eaten. The oak tree, which had been mentioned as the gathering point, was readily found, as it was the only oak in the field. It was evident that their number at this point had not been misrepresented, for the trunk was found enveloped to a height of eighteen inches with a firm web of silk which had been spun by the hosts of larvæ, as was also a decayed stump of about two feet in height, standing a few inches from the tree. Upon the upper surface of a prostrate log adjacent, and extending thence a short distance over the ground in the direction of the tree, was a similar web, and some large stones lying at the base of the tree, were also coated in the same manner. The web, especially that upon the tree, was of so firm a texture that it could be stripped from the bark in a continuous sheet, like a piece of woven silk. There were no excrementa mingled with it. Throughout the sheet were little openings of various sizes, averaging perhaps one-fourth of an inch, for which I was unable to account. They could not have been places of egress, for the construction of the web clearly did not permit of such immense numbers of caterpillars as were necessary to its formation, to have been massed beneath it.

A few stragglers of this host had been left behind, and were aimlessly, it appeared, slowly traveling over the web. They were secured, and ascertained to be identical with those which I had elsewhere observed. The object of the assemblage at this particular point, can only be conjectured It was not for feeding, for the closest scrutiny failed to give any evidence that the larvæ had ascended the tree even to the height of the lower branches. It is possible that there may have been a migration at this time and place from the desolated pasture, and the shade of this, the only large tree in the vicinity, may have been sought as an agreeable refuge from the hot sun suddenly appearing after one of the "April showers" which characterized this portion of the month of May.

As previously stated, the insect — the abundance and the ravages of which are above given — was generally accepted throughout the

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district invaded, as the "army-worm." The local papers abounded with notices of it, giving details of the number of acres of grass land already overrun, and sales of cattle which had been made in anticipation of an entire destruction of grass in both pastures and meadows, when the devastations already so serious should have developed into these migratory armies of which such graphic accounts have been given. Throughout St. Lawrence county, where the most serious ravages had been committed, general consternation prevailed, not confined to agriculturists, for there was apprehension that every lawn and grass-plot would be invaded. It became a common topic of village conversation. At a meeting of the Ogdensburgh Board of Trade, on the twenty-third of May, resolutions were passed, requesting from the State Entomologist such information and recommendations as might be of service to the farmers and the public generally: The Secretary wrote at this time: "Hundreds of acres of grass in the town of Oswegatchie, Lisbon and Morristown, are completely ruined. If an army of rebels or Fenians had invaded our frontier, the people could not have been more excited than just now over the ravages of this pest. Time can only tell what damages St. Lawrence county may be obliged to sustain on its account. Acres of pasture can be seen without a spear of grass upon them."

The caterpillars which I collected in the towns of Canton and Potsdam, and which I saw at these places slowly traveling over the herbage, lying dead upon the ground, attached to spears of dead grasses, or taken from their retreats among the roots of the grass, were beyond doubt, the authors of the above noticed wide-spread ravages. The appearance of the caterpillars was as follows: They were of a slender, cylindrical form, with the normal number of feet — sixteen. Their color was usually sordid or obscure greenish, with a shining black head. They were destitute of lines or other ornamentation, save four slightly verrucose, brown, piliferous spots on the upper portion of each abdominal segment, of which the anterior pair are broadly oval, and the posterior pair elongate-elliptical; some hairs of moderate length occurred in their usual position upon the body. The average length was about three-fourths of an inch. It was subsequently found that the larvæ had at this time about attained their maturity.

I was unable at the time of my visit to decide whether or not the depredator was that of *Leucania unipuncta*. If that species, it differed greatly from its appearance at maturity. But I had never seen the latter in its immature stages — the published descriptions were quite incomplete, and from the small size of the former, two moltings

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would be required in order to attain to the mature size of the army-worm, during which great changes might be developed. The observed habits appeared to differ in important particulars from those ascribed to that species, and above all, the time was nearly two months in advance of the proper season for its invasion of northern New York. Moreover, I could find no record of its appearance in destructive numbers in that portion of our State, which lies outside of the limits of its ravages in the map given by Dr. Packard.

On my return from St. Lawrence county, via the Rome, Watertown and Ogdensburgh Railroad, the ravages of the caterpillars could be readily detected from the windows of the moving train, at various places in Oswego and Jefferson counties, by the brown patches, usually of small extent, upon knolls and in the more elevated portions of the pastures.

A number of the larvæ which I had collected in Potsdam were placed in a box with sod, and brought home with me. They were objects of interest to many of my fellow passengers, *en route*, as the hitherto unrecognized authors of the injuries with which they were familiar. They proved difficult to rear in confinement. Although as near an approach as was convenient to their natural conditions was given them, most of them died, some escaped. Two of the cocoons only were subsequently taken from the sod. One of the caterpillars, after the death of the larger number, was removed and placed in a separate box with some blades of grass. Here it shortly went into the pupal state within the grass without forming a cocoon, and after sixteen days of pupation disclosed its imago, which proved to be that of *Crambus exsiccatus*.

In consideration of the poor success attending my attempts at rearing the larvæ, I wrote to a friend at Potsdam, requesting additional examples at their present more advanced stage. A large number were gathered from beneath sticks, pieces of rail, leaves, stones, dried excrements, etc., and sent to me. They presented quite a different appearance from the previous collections, but the difference was ascribed to additional moltings. They, however, proved to be of a distinct species — one of the *Noctuidæ*, known as *Nephelodes violans*, the larva of which had been named by Prof. Riley as the bronze-colored cut-worm. The caterpillars had never been known in such abundance before; fourteen were found under a piece of rail four feet in length.

The ravages of the Crambus caterpillars were nearly completed on the twenty-fifth of May, and by the end of the month they had

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entirely ceased. Reports published in the St. Lawrence Republican from several of the county towns, under date of June sixth and seventh, mention their disappearance, and that the pastures which had been eaten off were beginning to look green again — a gratifying evidence that the roots had not been injured.

Early in July, a communication was received by me from Mr. J. Q. Adams of Watertown, N. Y., accompanied by material which gave the first clue toward the identification of the larvæ. Their injuries had not been so serious in Jefferson county as in St. Lawrence, yet in the pastures near Watertown which had been infested by them, their cocoons occurred so numerously that a half-dozen could be taken from a piece of soil of the size of one's hand. The elongated cocoons, composed of earth and lined with silk, were placed with one end (the more loosely constructed one) at the surface of the ground and the other perpendicularly beneath it among the roots of the grasses. A hundred or more of these cocoons were kindly sent to me by Mr. Adams. Those that I opened for examination confirmed the statement of Mr. Adams that the transformation to the pupal state had not yet taken place, although the cocoons had been formed at least a month before. The caterpillars which they contained were identical with my Potsdam alcoholic examples, although notably of a much paler color than were those in nature — the result, doubtless, of their long exclusion from light during their cocoonage. They gave no evidence of having been parasitized, but were, to all appearance in a healthy condition, displaying when disturbed in their retreats a facility of locomotion fully equal to that manifested during their active stage of six weeks before. Early in June (precise date not noted) upon opening several of the cocoons, the caterpillars were found within them still unchanged. They had, therefore, at this time, remained in this state for a period between one and one-half and two months; the usual change of a caterpillar to a pupa after making its cocoon, occurs within a week. The delayed pupation in this species is an interesting item in its history. A similar prolongation of the larval stage is well known to pertain to at least several of the Notodontas among the *Bombycidæ*, which pass the winter in this condition, pupating only a short time before the disclosure of the moth in the spring, but it had never before come to my notice at this period of the year. Dr. Hagen, the distinguished entomologist of the Agassiz Museum of Comparative Zoölogy, at Cambridge, and also distinguished as a bibliographer, was unable to find in the extensive entomological library under his charge, any notice of delayed pupation among the

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Pyralidæ — the family to which the species belongs. It seems, therefore, not to have been previously recorded. Prof. Riley informs me that it has been observed by him in some species of *Botis*.

On the sixth of August the first moth was disclosed from my Watertown cocoons. It proved to be *Crambus vulgivagellus* Clemens, subsequently redescribed, as is believed by our best authorities, by Prof. Zeller as *Crambus chalybirostris*. The interesting and perplexing question of the preceding three months — to which of our insect depredators was chargeable the ravages in Northern New York, more serious in the extent of territory embraced than an army-worm invasion — was decided. The new enemy — the latest addition to our list of formidable insect pests, was found to be a modest, inconspicuous, and hitherto unobtrusive little Crambus.

To those who are not familiar with that division of the pyralid moths, the *Crambidæ*, to which this species pertains, it may be of interest to state that they are small moths, characterized usually by long and slender upper wings often ornamented by dots or lines in silver and gold, abounding in our meadows and pasture lands during the late summer and autumn months. When driven up by approaching footsteps, they fly swiftly for a short distance, when they alight upon a blade of grass or beneath a leaf, and wrap their wings so closely about them in cylindrical form as almost to defy observation.

About the middle of August the moths were abundant in the localities where these caterpillars had swarmed in May. Under date of August nineteenth, Mr. Adams wrote me: "The meadows and pastures are now filling up with the moths, and in places they fly out in small clouds." This, it should be remembered, is from a locality where the injuries done were moderate, compared to portions of St. Lawrence county. My only information from that portion of the State is from Miss A. Clarkson, of Potsdam, under date of September sixth, who writes: "The moths for the last three weeks have been flying in quantities, though more abundant a few days ago than now. At West Stockholm a means was devised for destroying them. Barrels were placed in the fields with water, on which was poured kerosene, which was set on fire. The moths were attracted to the light and vast numbers killed."

At the present time, the moths have probably nearly all deposited their eggs, dropping them in the grass — some of them adhering to the blades or stalks and others falling on the ground. The eggs hatch in about ten days. Some eggs which I took September first from a box in which moths from cocoons had been confined over sod, gave

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the caterpillars on September seventh. These are now feeding under my observation. Their development will be watched with much interest, as will also be those now hatching in our northern counties, if, escaping the numerous perils that environ them, they shall, before the frosts of October, renew and repeat their rapacious feeding, and, attaining their growth, form the cocoons to give forth the brood of the coming year. With our present limited knowledge of the *Crambidæ*, we may not venture to predict what the history of the species will be during the remainder of the year. From the fact that we do not know of the parent moths having been observed in the spring, for the deposit of their eggs, I incline to the belief that the larval depredations will not prove serious during this or the following month, but that the larvæ will only about half attain their growth after an amount of feeding which will not be very appreciable and will then hibernate in that state, ready, if they pass safely through the dangerous period of hibernation, to complete their growth and repeat their injuries during the ensuing month of May.

Reasoning from the known histories of other species, the probabilities are against the continuance of this insect as a serious pest, or even its reappearance in that role the following year. It has long been known to us, has not been regarded as rare, yet this is the first time that it has ever appeared as an injurious insect. Its remarkable abundance has resulted from a combination of favoring conditions essential to its multiplication, which had never to our knowledge, occurred before and may not reoccur during many future years, if at all. It has given us another instance of a sudden multiplication of a harmless insect into devastating numbers, of which there are many on record, and we will indulge the hope that many of these histories may be repeated by the equally sudden relapse of our vagabond Crambus to its former obscurity.

THE PUNCTURED LEAF-WEEVIL.—*Phytonomus punctatus* (Fabr.).

This species is the latest addition to our list of insect pests. It is an European species which has very lately been introduced in our country. It was first described by Geoffrey in 1762, but without specific name; in 1774 it was again described by Fabricius, as *Curculio punctatus*. The first public notice of its introduction was given by Prof. Riley in a verbal communication made at the meeting of the American Association for the Advancement of Science, held at Cincinnati in August last. Prof. Riley *en route* to the meeting, had witnessed its operations in Yates county in this State, where it was found

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feeding upon the leaves of clover, to which it was said to be destructive, both the larvæ and the perfect insects combining in the attack. The extent of its depredations or its abundance was not stated. The interesting fact was mentioned that this newly imported European beetle had first made its appearance in the locality where the clover-root borer — *Hylastes trifolii*, also introduced from Europe, was discovered in the autumn of 1878. It was deemed probable that the two species were brought over at the same time, but that the former, from its less rapid multiplication, had hitherto escaped observation.

The beetle measures over four-tenths of an inch in length, and is of a brown color, somewhat paler on the sides. The beak is rather short, broad and blunt. The thorax is traversed by three pale lines; both it and the wing-covers are clothed with short, yellowish-brown hairs, which upon the latter are grouped in spots as tufts. The prominent feature of the beetle, giving to it its specific name, is the series of close punctures arranged in ten deeply depressed lines on each wing-cover. There is no reasonable doubt of the identity of this species with the European form. Prof. Riley identified it from specimens in his cabinet communicated to him by the well-known European Coleoperist, Mr. Power, and it was also familiar to Mr. Schwarz, of the United States Entomological Commission. I have also closely compared it with a German type furnished me for the purpose of comparison by Dr. Hagen.

In this country nine species of the genus had previously been catalogued; in Europe the genus is also numerously represented. Two of the species, *P. nigrirostris* (also observed in this country), and *P. meles* var. *trifolii* are recorded by European authors as preying upon clover, but no mention is made of *P. punctatus* as attacking that plant. Dr. Hagen, as the result of an extended examination, states that he finds it not mentioned by any writer as injurious, nor anything relating to its history or food plant; and that certainly up to 1871 the larva was unknown. In a list of known larvæ of Coleoptera, published by M. Rupertsberger in 1879, among fifteen different species of *Hyperia* under which genus *Phytonomus punctatus* was formerly arranged, the species is included but no citation is given. Dr. Le Conte, whom I addressed for information, informs me that having gone nearly over the bibliography of the species, he finds no reference to its habits, except that it occurs abundantly in dry sandy localities. Prof. Riley, in a notice of the species in the September number of the *American Naturalist*, says that the beetle is not infrequently found by collectors in Europe, in turning over sticks and

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stones. This insect, therefore, furnishes another illustration of a change in habits, unfortunate to us, which has frequently been found to attend the introduction of European insects into our country, whereby species harmless in their native home become injurious here, or if injurious there, become much more destructive when brought hither, freed from their former enemies, and with new and more favorable surroundings.

THE PYRALID WEB-CATERPILLAR. — *Eurycreon rantalis* Guen.

This species belongs to the same family, viz., the Pyralids, of which the vagabond Crambus, above noticed, is a member, but to a different sub-family. It has not yet been known to be injurious in the State of New York, but as it occurs here, its history elsewhere shows us that we are exposed to danger from it at any time, when the proper conditions for its multiplication shall occur.

It is rather a common species in several of our western States, where it is present every year, but more abundantly in dry seasons. It infests several of the weeds, of which it is found more commonly on the amaranths (*Amarantus albus*, *A. retroflexus*, etc.), Indian hemp (*Apocynum cannabinum*), pig-weed (*Chenopodium album*), and rag-weed (*Ambrosia trifida*).

The caterpillars usually rest during the day within a leaf or leaves, which they envelop with their web. They are not gregarious, although several may sometimes be found sharing a common web. As they extend their feeding-grounds they enlarge their webs until the entire plant is enclosed. Their feeding is usually confined to low plants or to the lower portion of taller ones, and seldom extends to a greater height than ten or twelve inches from the ground. The caterpillar is slender in form and of about an inch in length at maturity. It is green, with pale stripes and black dots, with a few stiff, brownish hairs.

Like the vagabond Crambus, this heretofore harmless species suddenly became very destructive. In June of last year (1880), in some portions of the State of Kansas it made its appearance in such myriads that its former wild food-plants failed to give it an adequate supply, when it readily commenced a formidable attack upon various cultivated plants of the gardens and fields. Almost every vegetable seemed acceptable to it. It was found feeding upon the common and sweet potato, tomatoes, turnips, radishes, beets, peas, cucumbers, lettuce, etc. Some of these were entirely destroyed. Melons and beans did not suffer from them. Fields of corn were injured severely,

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and one piece of thirty acres was completely ruined by them. In some nurseries serious damage was sustained by the caterpillars stripping the leaves from young apple-root grafts and killing them, while the leaves of trees a few feet in height were untouched.

The greater portion of their injuries was committed within ten days. They were attacked by parasites, and their depredations in gardens were materially lessened by permitting fowls to prey upon them. Applications of Paris green and London purple were used successfully upon all plants to which they might safely be applied. After a presence of about three weeks many were killed by a severe rain, before they had reached the pupal stage.

The above information is mainly drawn from communications by Professors Popenoe and Snow, of the Kansas State University, published in the local papers and in the *Second Quarterly Report of the Kansas State Board of Agriculture.*

Eurycreon communis Grote, *E. crinitales* Lederer, and *Scopula occidentalis* Packard, are probably but different forms of the above quite varying species, which under this view would have a range of distribution (California, Texas, South America) admitting of great range of variation.

I have not heard of the reappearance of the insect in injurious numbers the present year.

In conclusion, permit me to refer briefly to the excellent progress that is now being made in Economic Entomology. The beneficial results which follow these investigations are more apparent every year, and they are steadily gaining popular favor, and enlisting the confidence and aid of those to whom we look for the means of successfully conducting them. The aid that has been asked from Congress for the study of such of our insects, the magnitude and wide-spread extent of whose injuries have made them of national importance, has been granted. The new commissioner of the Department of Agriculture at Washington recognizes the direct bearing of insect investigations in the promotion of agricultural interests, and there is both assurance and evidence that he will give to them his cordial support. Chairs of entomology in several of our agricultural colleges are ably filled, and are producing valuable results — the fruit of observation and experiment. At least three of our western States are moving earnestly for the appointment of State Entomologists, with every prospect of success. Our own State, as you know, for you were instrumental in it, has recently established the office of Entomologist. I may say of

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the incumbent of the office, that he is devoted to the work for which he has been set apart — recognizes it as a path in which agriculture and its allied interests may make great advance, and is desirous of shewing its capabilities in this direction. To this end he proffers his services to this Society, to the full extent that he may render it service. If that cordial co-operation of the members of the Society which he desires, is extended to him, his studies will prove more satisfactory to himself, and of greater practical benefit to the community at large.

After the reading of the above paper, opportunity for comment was offered, when Mr. Scoville, of Oneida, suggested that certain insect depredators were less troublesome than in the past, and asked if the area occupied by the clover-seed midge had been extended or diminished in the last two or three years.

Prof. Lintner gave it as his opinion that the district infested had certainly not been enlarged, and he believed the ravages of the insect were less even in the fields it occupied. He cited in support of this opinion, a recent report from a Schoharie county farmer who had told him that a few years ago, when drawing clover hay, his barn floor had been alive with the red larvæ dropped from the heads, but in the past haying he had hardly noticed their presence. Another depredator, especially destructive to the roots of clover not long ago (the *Hylastes trifolii*), he thought had lessened its ravages materially.

Prof. Roberts, of Cornell University, reported renewed success with clover in Tompkins county, where the heads in the past season had bloomed freely for the first time in several years, indicating exemption from the seed midge.

Mr. Batchelor, of Oneida county, reported success in freeing currant bushes from worms by the use of soot freely sprinkled on the leaves. While he did not assert that soot would be found an unfailing remedy, it had proved in his practice quite as effectual as hellebore.

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EXPERIMENT STATIONS.

A Paper read before the N. Y. State Agricultural Society, at Elmira, Sept. 14, 1881,

By E. LEWIS STURTEVANT, M. D.,
Of South Framingham, Mass.

My text is to be found in the United States Department of Agriculture Statistics for 1879, and reads:

For New York State.

Acres in principal crops, viz.: Corn, wheat, rye, oats, barley, buckwheat, potatoes, tobacco and hay	9,089,147
Value of above.....	$128,574,607
Value of live stock	143,481,021
Average value per acre of cleared land.....	58.48
Average cash value of product per acre	14.15

Deductions which may be made are that an increase in crops of but one per cent in quantity represents an aggregate gain to the farmers of $1,285,746, and the like may be said for an increase of one per cent in quality; or a diminution in expense of working of one cent an acre represents a saving of $90,891 in the aggregate. The increasing of the average cash value of produce per acre from $14.15 to $15.00 represents an aggregate sum to the State of $7,725,784.

These few figures, startling in their aggregate, almost insignificant, seemingly, to the individual farmer, yet bring forcibly to our attention the foundation for the public interest in measures which shall tend to render farming life more profitable and more attractive.

If through public measures the farmer can be so instructed that, with the same resources that at present are within his control, he can increase his cereal crops even one peck per acre, the gain to the State is 852,000 bushels. If through a better system of management one sheep extra could be kept on each farm, the aggregate value would be represented by $769,000, and an additional cow would represent an aggregate increase of $6,250,000. These figures show conclusively that the subject question, how to improve the farming of the Empire State, is well deserving of thought, and is not unworthy the attention of statesmen.

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As to Resources.

If each farmer should contribute one quart of corn for each acre cultivated, the sale would furnish sufficient money to demonstrate annually that farming could be made immensely more profitable, and to furnish information in a practical way, of the utmost reliability, that should increase the crop of corn, not only by quarts but by bushels. A tax of one cent on each milch cow would furnish more than sufficient money to demonstrate how each cow could be maintained at a greater economy, and with increased product.

The How.

The means at the disposal of the State for the attainment of the object which these figures show to be so desirable are many; but the one that I shall select as being of the utmost importance to discuss is deserving the appellation of "personal equation," or more lucidly, but less sharply expressed, the teaching of the individual farmer by practical example and precept how to develop the resources at present within his control, so as to insure him more ample profits and less of toil. Thus, to illustrate by personal example: Some years ago, when young at farming, I was satisfied with an average yield of fifty bushels of corn per acre at a cost for labor of forty cents a bushel, and at an expenditure for manure of sixty cents a bushel; the stover at the then price of corn representing the profit. Now I am dissatisfied with my average yield of eighty bushels per acre, at a cost for labor of twenty-five cents a bushel, and an expenditure for manure of thirty cents a bushel. Formerly I was satisfied with an annual milk yield of 2,300 quarts per cow, feeding heavily of grain and purchased foods. Now I am scarcely satisfied with an average annual yield of 2,300 quarts per cow, feeding no grain, no purchased food, and but little food of a saleable character. The difference in my case has not come from increased resources, greater expenses, better markets, or changed climate, but purely and simply from the improvement in my "personal equation." I have better learned how to manipulate the *relations* of the farm, and have been yearly taught by the lessons of experience which have been carefully conned.

Now this "personal equation" of the farmer, it seems to me, can be improved through organized and well planned effort, and the form which this effort can well take is the "Experiment Station," an agency whose practical value, so it seems to me, has been largely misapprehended, because such efforts as have already been attempted under this name have not realized the true object to be attained by State aid

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for the benefit of the industrial classes. As Prof. Hilgard truthfully says of geological survey: "It is difficult to see on what ground the study and publication of the most recondite details of geology, lithology and paleontology, should have precedence of the fundamentally important work that concerns directly the productive industries." Thus, while a believer in the importance of science and the paramount importance of scientific method, I as thoroughly believe that the want of popular appreciation and the reverses with which State agricultural institutions have proverbially to contend, are quickly traceable to an omission to conform to the natural and just expectations of the public for whose use they are intended. But I must come closer to my subject.

EXPERIMENT STATIONS.

Professor Newcomb, in the *North American Review* for August, 1881, discusses astronomical observatories, and his remarks are so fitting to my subject that I shall give a few quotations, the italics being mine.

"It is as true in astronomy as in any other department of human affairs that the best results can be attained only by a *careful adaptation of means to ends.* Failures have arisen, not from the intervention of any active opposing agency, but because observatories have been founded *without a close conception of the object to be attained, and, therefore without the best adaptation of means to ends.* To build an observatory before knowing what it is going to do is much like designing a machine shop and putting in a large collection of improved tools and machinery before concluding what the shop is to make, and what are the conditions of the market open to its products. Some hints on the considerations which should come into play in the erection of any new observatory may not be out of place, as pointing out the remedy for the evils we have described.

Heretofore the practice has usually been first to decide upon the observatory, and to plan the building; next, to provide instruments; and lastly to select an astronomer, and with his advice to decide what direction the activities of the establishment should take. This order of proceedings should be reversed. The first thing to be done is to decide what the observatory should be built to do. The future astronomer would, of course, have a controlling voice in this decision and should, therefore, be selected in advance."

And again: "The man of genius with imperfect instruments will outdo the man of routine in the greatest building, with the most per-

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fect appliances that wealth can supply. The combination of qualities which insures success in such endeavors is so rare that it is never safe to count upon securing it. Hence, even now a great observatory for the prosecuting of physical research would be a somewhat hazardous experiment unless the work it was to do was well mapped out beforehand."

These ideas seem to me to be at the basis of any consideration of an experimental station for agriculture. The work of the institution must be carefully mapped out in advance. The director must be in sympathy with the work which is to be done; the institution must grow from small beginnings "by a process as natural and simple as that of the growth of a tree," so that in time, without excrescence or blasted parts, it shall, in perfection, be in entire harmony with the object for which it is founded and maintained.

THE OBJECT.

The objective point for which an experiment station supported by public funds should strive, is in its outcome a productive one. It is not established for the purpose of investigating subjects of abstruse science, but with a practical, well defined hope that through its agency and its work, farming shall be rendered more profitable to the individual and the State. Its usefulness is to be measured by the practical good it shall accomplish, and it must deal with relations as well as facts. Its work must be such as to be comprehensible by the farmer who possesses but a common-school education, in order that its teachings may be of general utility. At the same time its work must be done under the methods of science; its work must be verifiable in order to be trustworthy; its data must be true facts and true relations. Hence we must have, in its special, as well as in its routine work, a double purpose, the one scientific of necessity, the other, and the more important one, proceeding logically from the first, the practical purpose; and by the sufficiency of this latter the success or failure will be measured by the farming public. Hence, an experiment station, properly regarded, must expect the sympathy and commendation of science and practice alike.

Other objects usually assigned to such a station by common consent, are not to be discussed here, as not being experimental in their nature, although usefully added to the duties of the institution on account of their importance, convenience and their close relation to agriculture. I refer to "fertilizer control" and analyses of such products of varied nature as are used on, or are connected with, the farm living and farm business, germinative seed tests, etc.

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The Theory.

I trust that the use of this heading may not prejudice. It here means simply the exposition of the general principles which should govern the establishment of an agricultural experiment station, the idea upon which the attempt should formulate into action.

Location.

The station is for the farmer's benefit, primarily, and is to deal with farmers. Therefore it should be located in a place easy of access. Nearness to avenues of travel and nearness to population is one important point. One of the most effectual means of instruction is through the eye, to be supplemented by description. The farmer who sees and understands, is likely to carry away with him ideas which shall become adaptable to his home use. Again, being under public observation, more interest is naturally attracted toward its work, and the institution can more easily keep in accord with that great agency for the diffusion and furtherance of knowledge, the public press. Nearness to population gives a moral power.

A large farm is neither desirable nor beneficial. It is not the object of the station to enter upon farming, but it requires sufficient room for such experimental crops as it shall grow, and requires a certain diversity of soil. A broken region which supplies this want, other things being equal, is to be preferred to a flat region of uniform structure, without much attention being paid to geographical location. Whether the station be located in northern, southern, western, eastern or central New York is in itself of little consequence, as the more important question is, whether the location admits of results which may be applicable to the farming of the whole State.

Buildings.

These should be simple and inexpensive, but exactly adapted to their purpose. Rather omit than add structure beyond present uses. It is wise to reserve the endowment or income as far as may be for actual experiment, and only add to the structure as circumstances render additional room necessary. It is the men and not the buildings that do the work, and the proper man with proper facilities, will accomplish more than the mere routinist, notwithstanding the latter may have magnificent buildings for his occupancy, and a wealth of apparatus.

Labor.

The head of an experiment station must be a director in fact rather than a specialist. Under him should be specialists whose duty should

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be to carry out such investigations as are assigned to their charge. It is also desirable to utilize the volunteer or paid service of gentlemen of acknowledged fitness, wherever they may be found, assigning to them work which can be done as well at their homes. In this way the influence of the station is extended, investigation is encouraged, and greater results can be accomplished from given expenditure, than if all work were confined to the station. The Smithsonian idea has proved for science a most profitable one. Under a fit direction, the station will attempt experimental work covering crops, stock and manufactured products. Under a specialist the station is apt to be confined to one class of investigation alone; if a chemist, the investigation takes a chemical turn; if a breeder, too much prominence will be given to questions affecting stock; if a dairyman the dairy will be apt to assume an undue prominence; if a scientist merely, the practical will be apt to be overlooked; if a practical man is called, through lack of scientific training the station will be apt to accomplish work which shall neither be accurate, nor scientific. The proper man is the complete man, of general acquaintance with science and practice, and capable of judging of the efficiency of the work whether in the laboratory, plant-house or field.

As the station is assumed to be a State Institution, the labor should be proportioned to the needs of the State, and the relative importance of the various branches of husbandry, overlooking none, but attempting all, according to its means.

SYSTEM.

The system must be a scientific one: That is, it must allow of the results being verifiable. The outcome must be a practical one, one that shall teach the farmer facts and relations that shall in their use bring profit. The presentation of the work must be such as shall tend to convince of the reliability and thus tend to persuade the farmer to attempt to modify his practice according to these teachings. Hence the press should be used, and this great power kept in sympathy with the work, its aid should be invited and its criticisms considered. Annual reports should be issued, showing in detail the work in progress. Visitors should be welcomed and instructed, so that each one shall carry away information of worth, and being convinced himself shall in turn serve as a means for extending the information to others. The officers should be required to lecture upon their work, at suitable periods and opportunities, and the station, during the growth season, should hold field days, and thus information be given to large audiences in the presence of the growing crops, which shall serve as present

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illustrations of the truths that are spoken in relation to them. In one word, the institution should be educational in its tone and in its efforts.

The Means.

The means at the service of a station should be a laboratory for chemical and physical work, a plant house for investigation, a stable for feeding, and land for experimental illustrations, together with such apparatus as may be necessary. Sufficient labor, so there may be no slighting, no haste. Experience would develop other buildings, other objects, but such may be neglected until occasion shall show the imperative need. The funds should be ample for necessary expenses, yet should not be so large as to encourage extravagance. Above all, the work should be laid out in advance according to the means for its accomplishment. Too little work under the appropriation means waste, too much attempted work under the appropriation means folly. Experiment is not farming, and is costly far in advance of practical work, as accounts are to be kept, and conditions studied and maintained.

To go more into details. Agricultural experimental work, so called, may be divided into two branches: Agricultural Investigation and the so-called Agricultural Experiment. The first is the acquiring of information which is essential to the carrying out of the second, but which in itself may not be directly profitable; the second, founded upon information gained through experience and science, must have profit as its aim — the showing how to grow, breed, feed or manufacture at a profit. Agricultural investigation, to be carried on in the laboratory and plant house is a prime requisite for a successful station but must not have undue prominence. Much in this line has already been accomplished by others, and such work the director is to be supposed to have cognizance of. The laboratory and the plant house are to be used to secure information upon points not already settled, and to explain matters whose correct understanding is essential to the proper interpretation of the field and feeding work. The experiments connected with the uses and manufacture of milk must also be carried on under cover. The station should also possess apparatus for loan to volunteer workers to whom it is desirable to assign special work.

Agricultural experiments, as the term is generally understood by farmers, means field and stable work. I have but little faith in the value of this class of experiments when carried out under the systems now in vogue. Yet this class of work constitutes an important part of a public institution of this character, and deservedly should receive most careful attention, and deservedly should be a promi-

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nent feature. The promise of this class of work is to illustrate and verify conclusions, so that the teachings of the station can be seen of all to be correct and trustworthy. The resourses which have been utilized must be shown clearly, and the results gained must be evident and beyond cavil. The system must show the value to be assigned to the various factors which enter into the crop, such as seed fertilization cultivation and the personal equation — must show the effect of the seed in its relations to fertility, culture and the timing of processes; must show the influence of various fertilizers in their relations to manner of application, and the character of composition; must show the effect of culture under the varied conditions induced by changes occurring, from the seed used, the fertilizer used, and the timing of the process; and finally, must show the conditions under which a maximum crop can be most cheaply raised through the proper manipulation of these various factors. We thus have the experiment and the test, a course which should accompany every well-defined, practical experiment. Did space allow, like remarks could be made upon experiments upon feeding of stock, manipulations of dairy products, etc., etc.

A farm experiment, so-called, made by one who is unable to raise under farm conditions, the maximum average crop of his locality, can be considered little deserving of extended credence and following into practice, and every field experiment should be conjoined with a test of what the experimenter can practically accomplish under favorable conditions in order to make its testimony more conclusive.

THE ATTAINMENT.

The best success to be hoped for is to determine the value of the various factors which are included in the complex art of farming, and to convince the farmer of their value and truth so that his practice may be modified thereby. In order to accomplish this, various allied investigations shall add tribute to the demands of science, and in furthering progress shall be also a boon to society. Various and numerous facts are to be determined, outside of their relations, to aid the student and investigator and practical man, agricultural pursuits are to be ennobled and rendered more attractive, farm life to be more abounding in pleasure, the farmer to become to be a better citizen as his intelligence acts to make his work freer from toil and more productive, the State benefited by an advance, general in its nature and important in its character.

A tax of one cent on every ten acres under cultivation, or a contribution of one pint, or even less of wheat, for each acre sown, or a

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dime contribution from each owner of a herd of cows, would be ample to establish and maintain an Experiment Station, whose work could return dollars for cents, eagles for dimes, to any farmer who would receive instruction.

The difference which may be observed between the average crops of the State, and the crops of the better farmers, the differences that are observed between adjoining farms, the product of the average cow as contrasted with that of herds kept by the better dairymen, the amount of poor product of orchard and dairy that reaches the market, are all convincing proofs of the need of further knowledge on the part of the individual farmer, whereby the poorer farmer can be taught to approximate his results to those at present attained by the better farmers.

Experience has shown that among the duties assigned to an Experiment Station, that single one of fertilizer control has in every case saved to the farmers of the State many times the cost, and has, by securing genuineness of material, secured a larger and wider use. Reason makes equally clear that an Experiment Station can, by an educational system of a little cost, accomplish far more of a saving by showing the farmer the conditions under which larger crops may be grown, greater results earned in money, and difficulties arising from excessive rains, drouths, etc., obviated or mitigated.

The facts of history also show that the extension of knowledge among a class tends to elevate that class in the ranks of citizenship. Peasantry seems only co-existent with ignorance. The overseer receives more consideration than a laborer, for it is recognized that the qualities he possesses are, as a rule, more deserving of respect. The man who understands his business gains quick recognition and standing. The position the farmer now occupies has been secured by his intelligence; to attain a more enviable position, a greater intelligence is required. An Experiment Station tends in its nature to educate the productive man, as now the school and the university educate the boy, but by a different method and for a separate purpose. It moreover tends to elevate the farmer, to secure for him a higher position as a neighbor and as a citizen, as making of him a man of more understanding by perfecting his industrial training, by supplementing his local experience.

The profit in an Experimental Station may be great; the cost to the Empire State of trifling insignificance; the advantages evident. May New York in her wisdom initiate this great boon to the farmers and the public, promptly, generously and wisely.

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GRASSES BEST ADAPTED TO MEADOW AND PASTURE IN THE STATE OF NEW YORK.

A Paper read before the N. Y. State Agricultural Society, at Elmira, Sept. 15, 1881,
BY DANIEL BATCHELOR,
Of Utica, N. Y.

I am invited here to read a paper before you on the subject of "Grasses best adapted to meadow and pasture in the State of New York." As I understand it, my effort is preliminary to a general discussion here on the important subject which I am so little qualified to present. Of course I shall not attempt, nor am I able, to describe a tithe even of the thousands of varieties of grasses known to botanists under the generic term *gramineæ*. It is true that I have heretofore made some ambitious attempts, by collation, quotation and otherwise, to describe many varieties of grasses. To those, however, who would study this interesting subject practically and more comprehensively (and every farmer should do so), I recommend the excellent book of Prof. Flint and also the admirable papers of the late John Stanton Gould, especially that one on grasses, with finely engraved illustrations, in the published transactions of the New York State Agricultural Society for the year 1869; also, by the same writer, an essay on forage plants, illustrated with fine lithographs and published in the transactions of the State Agricultural Society, for the years 1872 to 1876, inclusive. And here let me in continued egotism say that, although I possess but the merest rudimental knowledge of the structure and physiology of the grasses, yet I may be pardoned in stating that for many years I have labored, and with good success, in inducing the farmers of Oneida and adjoining counties to introduce more varieties of grasses into both meadow and pasture, and to-day there are scores of acres of meadow in Oneida county where from three to four tons of hay to the acre is the annual result of growing mixed grasses, on lands where, before these mixtures were introduced, but meagre crops of timothy hay were gathered, with little or no aftermath for autumn; but now wherever plenty of mixed grasses are grown there is good fall pasturage or

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plenty of rowen if cattle are not let in. So much and, perhaps, too much, by way of personal explanation.

Prof. Flint in his book on grasses says: "I hold this proposition to be indisputable that *any soil* will yield a larger and more nutritious crop if sown with several kinds of nutritious grasses than when sown with only one or two species. Indeed it is a fact well established, by careful experiments, that a mixture of only two or three species of grasses and clover will produce a less amount of hay than can be obtained by sowing a large number of species together. I am aware that the prevailing practice is decidedly against the use of anything but timothy and clover and that large crops of these, under favorable conditions, are often raised; but it is nevertheless true that we obtain, on an average no more than a ton to the acre, while with the same culture and a larger number of species we ought to get more than double that quantity of hay."

A large item of expense in farming accounts arises from the constant seeding of meadows with nothing but timothy and clover, as if these were the only grasses fit for hay, and yet there are other grasses not only as good as timothy, but also possessing a power of permanence and of producing a good sward, thereby protecting the timothy from upheaval by frost. A permanent meadow is almost impossible on some lands, where timothy and clover are the only forage grown, and yet, as Prof. Flint says, many believe that these are all that are needed, notwithstanding the fact that many meadows thus treated will not produce more than one mowing without re-seeding. In fact a close mowing followed by hot dry weather, will often destroy the bulbous roots of the timothy entirely, thus causing the grass to disappear, leaving no aftermath at all. Although timothy is one of the most nutritive of grasses, yet under the usual conditions it stools but little, and its after growth is always thin, thus showing plainly that to keep this grass well in the ground, especially where liable to heave with frost, it ought to be grown with such other meadow grasses as will ripen with it; by so doing, good, heavy hay will be produced, the aftermath will be thick and the sward less liable to heave in winter, while the timothy can be held in the ground for many successive years, thus avoiding the extra expense and labor of constant re-seeding.

What then are the best mixtures for meadows in our State? That is, what are the best to ripen evenly in our climate with the timothy and clover for good hay? The question is not what are the best for Old England and even for some portions of New England. It is not even what are the best species for eastern Pennsylvania, the

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States of New Jersey and Connecticut, but it is what are the best meadow grasses to grow in the great grazing lands of New York. Almost all distinguished writers on grasses in this country follow the lead of the English authorities, and recommend in their meadow mixtures of grasses and forage plants, some of which will not ripen, uniformly with our staple grass, timothy, while others are added to their mixtures that will not stand the winters of central New York. It is worse than useless to sow tender grasses or forage plants in Oneida and bordering counties. What is required there is good, hardy, succulent grass, that will ripen, or nearly so, with the timothy. Even our highest authorities recommend, in meadow mixtures, the famous Ray grass, or what is known as English perennial rye grass, *lolium perenne*, which is to British agriculture what timothy is to the American farmer, the staple grass. There are many bales of the seed of this grass imported every year into this country, and the seed is extensively and indiscriminately used in meadow mixtures all over the country. Until better instructed, I must say that English perennial rye grass is good for nothing in northern and in central New York. I have sown *lolium perenne* three seasons in succession, the last time in a protected spot, surrounded by buildings, but have never yet succeeded in carrying this grass through a winter in Oneida county. On the Honorable Samuel Campell's land it disappeared, blade and root, entirely, notwithstanding there was a dense sod of it when the first snow of winter fell.

As I have already intimated, almost all writers on the grasses in this country conclude their essays or books with a formula of meadow grasses for the whole northern States, regardless of the differences of climate. Some writers advocate a score or more of grasses to grow with timothy; conspicuous among which are the two large, valuable and very early varieties, the orchard grass, *dactylis glomerata*, and the meadow oat grass, which are altogether too early to grow with timothy, but when these two, the oat grass and the orchard grass, constitute together a meadow in about equal proportions, no combination of grasses can be more profitable to the dairy farmer, either for early hay and afterwards for soiling, or late pasturing. I am reluctantly led to the conclusion that there are but few grasses adapted to our meadows. I mean by this that there are but few that will stand the climate and ripen evenly together, making a good uniform sward with our timothy. I name such as my own observation and actual test, on bleak uplands and in intervals, have shown to be by their time of ripening, hardiness, structure and average altitude adapted to our soils and to grow with

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timothy and clover: Rough stalk, foul meadow, yellow oat, Italian rye, tall fescue, meadow fescue and red top. If the meadow is moist then fescue or bromus grass and alsike may be introduced. The grasses above named are, most of them, good not only for meadow but for pasture after one or two mowings.

I will now name separate mixtures for meadow and also for pasture, such as I know have been productive of the very best results. For an average meadow, per acre: A mixture consisting of twelve pounds of timothy, five pounds Italian rye grass, five pounds meadow fescue or tall fescue, four pounds red top, three pounds rough stalked meadow grass, six pounds medium clover; as before stated, if the meadow is moist, bromus and alsike may be introduced, the red top increased and the fescue and clover lessened. For a permanent pasture per acre: Five pounds Kentucky blue grass, five pounds meadow oat grass, five pounds orchard grass, five pounds meadow fescue, five pounds red top, two pounds sweet vernal, two pounds Pacy's dwarf rye grass, and, if not natural to the land, two pounds white clover.

Though not entirely pertinent to my subject, it may not be out of place for me to say that in the best lawns I have ever seen, and some of which I have made, the grasses were composed of a mixture, in about equal proportions, of Kentucky blue, meadow fescue, red top, crested dogstail, and Pacy's dwarf rye. The introduction of white clover into a lawn is a matter of taste, in some soils a matter of necessity; I prefer the grasses only. As I have before me specimens of the several kinds that I have named, I will show them in some kind of order and briefly describe each variety. And first here is the well known orchard grass or *dactylis glomerata*, which the English farmers named "rough cock's foot," from its fancied resemblance to the foot of the chanticleer. This grass with us is a native, perennial, and very hardy; indeed it has recently been found growing in Alaska. It is one of the most valuable grasses in our country and is the earliest and the most rapid in its growth of all the northern grasses; the more it is cropped the better it thrives, while all kinds of stock delight to feed on it when it is young; and it is highly appreciated by all good farmers the world around.

Meadow oat grass, or *avena elatior* is a most valuable grass, either for pasture or to grow with orchard grass, as it is very hardy, ripens early, is very luxuriant in growth, stools well and produces abundance of early and late foliage which is highly relished by cattle. I saw a meadow, composed of about one-third of this grass and the remainder orchard grass and clover, which was cut early in June last and a large

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crop taken off. The same meadow, I was informed, was to have been mown again on the tenth of this month.

Italian rye grass, *lolium Italicum*, is on the continent of Europe, what timothy is to America, the approved grass for all climates and situations; having, too, this advantage over timothy, that it frequently produces a second crop of hay and after that a rich aftermath. In Britain it is the grass most resorted to for soiling purposes, as it will continue to produce repeated cuttings all through the season. By Way's analysis, Italian rye grass ranks very high in nutritive value. It is not, however, a perennial grass, though it will often show itself abundantly for the third and sometimes the fourth year after seeding. It is therefore more than a biennial.

Perennial rye grass is supposed to be of English origin and has been well known and approved there for two hundred years, but as I have already stated, it is not hardy.

Pacy's Scotch variety of rye grass is too short for our meadows; it is, however, one of the early grasses, is hardy, its roots being fibrous and very tenacious, it will stand any amount of cropping and cutting and will spring up in rich green aftermath till late in autumn. When sown with crested dogs-tail grass the combination is said to make the best kind of sheep pasture, as both are fine succulent dwarf grasses and will keep on sprouting all summer, no matter how much the pasture is nibbled by the sheep.

Between meadow fescue or *festuca pratensis*, and tall fescue or *festuca elatior*, I have never been able to discriminate; there are authorities who contend that they are identical, climate and soil only making the difference.

Meadow fescue is known in West Virginia as Randall's grass, and in some sections is known as evergreen grass. It is a grass which is slowly gaining ground in our pastures to the displacement of, or at least to a joint occupancy with, our June grass. It ripens later than the June grass and has a plumy top, inclining to one side, the seed husks being oat-shaped and much larger than the June grass. The latter carries its top erect and spreads out, all around, its flower branches almost horizontally from the rachis or connection with the stem.

Red top, *agrostis vulgaris*, is a variety of what is known in England as "bent grass," of which there are many kinds so closely related that botanists do not attempt to distinguish them. Red top, Rhode Island bent, the herds grass of Kentucky, the varieties of English bent and what is called Borden's grass are one and the same, the differ-

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ences in color of the top, from white to purple and to brick red, are but the results of climate or soil. The red color, however, seems to be more fixed in this grass than any other shade. Red top is of European origin, and as it is a hardy perennial and produces, in a rich meadow with other grasses, good, fine hay, it ought to be cultivated. Red top, like oat grass, is very social and will disappear in patches, when sown alone, as if it were inviting other grasses to occupy the vacant places. It is an entire mistake to suppose that red top is only adapted to moist land. It will grow abundantly but stunted on a sandy soil in company with the vilfa grasses.

Kentucky blue grass, *poa pratensis*, is identical with what is known in this and the Eastern States as "June grass." The Pennsylvanians call it "green meadow grass," and the Jerseymen know it as "spear grass." I think that there is some doubt as to whether it is or is not indigenous. At any rate it is found abundantly all over Europe, and is very popular in England both as a pasture and a meadow grass. The farmers in the British Isles say that June grass produces the finest, softest and most digestible hay. Prof. Way rates its nutritive qualities far below orchard and timothy grass; but may not its fineness and the fact that it is easily digested make it equal, if not superior, in nutritive power to many grasses which rank higher in analysis for flesh forming and heat producing properties? The farmers of Kentucky know that it will make large, fat cattle, and the cheese makers of Herkimer county, in our State, know full well the value of this grass, for it forms over sixty per cent of their pastures and comes on thickly in their old meadows. Kentucky blue grass does not produce much from the first crop after seeding, but when once established with other grasses it produces the sweetest of hay and is remarkable for its vigorous growth in autumn.

Foul meadow grass, *poa serotina*, is very common in the Eastern States and is highly approved of for a pasture grass, as it never becomes so coarse but that its stalk is tender, and as it continues to throw up green shoots it can be mown early or late. It is not easy at certain stages of its growth to distinguish this grass from the meadow spear grass, *glyceria nervata*.

There are several varieties of *Bromus* grass, not many of which are approved of as meadow grasses. The chess or cheat belongs to this family. *Bromus Schraderi*, however, is a grand grass for moist meadows; its foliage is abundant and cattle eat it eagerly. In England four or five crops of *Bromus* are sometimes cut in one season,

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and it is considered there to be as good as orchard grass. It has been introduced into the meadows of Oneida county and is well liked.

Rough stalked meadow grass, *poa trivialis*, ranks high, by analysis, for its nutritive qualities and is a good pasture grass, especially for moist situations.

Meadow fox tail, *alopecurus pratensis*, is a European grass closely resembling timothy, but its roots are much more fibrous and tenacious, the flower spikes shorter and softer, and being so much earlier in flower it need not be mistaken for timothy. Dickson says that it is one of the most valuable of natural grasses, whether for bulk, produce, quality, earliness or succession. I have never seen this grass on uplands, but it may be found in strong, moist land like the vales and intervales of the Oriskany and the Sauquoit, where it is often found. It is difficult to save the seed of this grass, as it is infested, when in blossom, by an insect which delights to burrow in the soft husks of the flower.

Sweet vernal grass, *anthoxanthum odoratum*, does not rank high for nutritive qualities, yet animals like it and it imparts a most delightful healthy odor to hay. Who can tell how much comfort is given to an animal by mere sweet savor, even when there is but little nutrition in the aliment? Who can tell what amount of mechanical action is necessary in giving bulk or distension to the stomach of a ruminant? Who can tell what is assimilated by, or what is eliminated from the minute vesicles of an animal? Be that as it may, there can be no doubt but what the sweet vernal grass fulfills its place and functions in the mass of gregarious grasses by which it is surrounded. Sweet vernal is the only northern grass which produces benzoic acid. I am inclined to think that this acid not only gives the grass its aroma, but imparts to the secretion of animals feeding on it an antiseptic property, for it is well known to pharmacy that benzoic acid, even in minute quantities, is a powerful preservative of cerates and fatty compounds of all kinds. If this speculation is well based, or even if a slight savor of the aroma only is imparted to butter made from animals feeding on sweet vernal, it should be encouraged to a limited extent in our meadows and pastures.

I have already adverted to the social nature of the grasses. It is said that Sinclair found in the old pastures of England as many as thirty varieties in the space of a foot square. It has been ascertained by repeated experiment and observation, that many grasses will almost entirely disappear in a few seasons, if sown and grown alone. Yellow oat grass will die out the second season from the seeding, if

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sown and grown alone. Red top, as I have already stated, will die out in pastures if it is not accompanied with other grasses. It is true that there are but few regions in America where can be shown such luxuriant grassy verdure as is to be seen in the British Isles. Yet I have seen grass lands in the valley of the Mohawk and in the lateral vales, the Sauquoit and the Oriskany, that would not discredit any country, and notably a permanent meadow in New Hartford, Oneida county, owned by Mr. Morgan Butler, who has cut from it, on an average, over two tons to the acre for the last fifteen years besides the fall feeding. In this meadow can be found fescues, oat grass, bent grass, Kentucky blue grass, rough stalk, timothy, vernal grass, and clover, all rejoicing in social profusion together. To repeat myself, I state in a positive manner that the great mistake we make is in not recognizing the social character of the grasses, and that they are like the forests, where a great variety of trees grow together. 'Tis true that we sometimes see solitary "pine barrens" instead of multiplied varieties of deciduous and evergreen trees; but the very term "pine barrens" tell us what is the matter. So, also, do we see the solitary vilfa, the comb, and the poverty grasses, in poor lands, and glycerias in the swamps; but wherever the land is good and the pasture unvexed there, as in Mr. Butler's meadow, do we see the grasses in many varieties growing together. There is plenty of timothy in the Butler meadow, and yet none has been sown there for many years, thus showing that with other grasses to make sward, the timothy will not "run out," as the phrase goes. It would seem that a mere statement of these facts is an argument sufficient in favor of introducing a great variety of mixed grasses into our meadows.

A few days ago I heard a farmer say to his neighbor who had asked him what he intended to do with a piece of good land from which he had taken oats and the timothy had failed. The reply was, "I intend to plow it, sow winter wheat and seed down with timothy and clover, and after mowing once let it go for pasture." It occurred to me that if the circumstances, meterological or otherwise, were unfavorable the farmer would have to wait some time for the native grasses to come in sufficiently for him to have a pasture. The timothy alone, under the most favorable conditions, would not do it. Now if this man will cast in with his timothy and clover, some fescues, orchard grass, Kentucky blue grass, etc., in proper quantities and due proportions, the autumn of 1882 will exhibit to him, if he is alive, a luxuriant pasture there.

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It may not be inappropriate to say something here of the effect of sweet herbage on the flavor and savor of meat, milk, butter and cheese. Two or three years ago a leading agricultural paper, in an editorial, stated the following: "Mere cleanliness will not of itself, give sound milk and cheeses that will satisfy foreign consumers, unless the *regime* of the cow is strictly watched. If her food is unnatural and the water she drinks impure, she may give as much milk as ever, but the milk has a ferment in it which will breed mischief in the cheese and malady in those who use the milk. No one who uses milk or cheese can be sure that its food is always wholesome and harmless, unless he knows that the grasses and roots the cow eats are sweet and the water she drinks is limpid and pure." This is wisely and tersely said. It is conceded by all that the hay, grass, roots, grain and water on which the cows feed must be clean and sweet, else the best results cannot be obtained either in butter or cheese making. The mere art of making Parmesan and other kinds of Italian cheese is well and widely known all over Europe, but what fields are there outside of the dairy region of Italy, where every noxious weed is exterminated, the highest possible culture of the meadows practiced, and the greatest number of nutritive grasses and aromatic herbage encouraged. It is well known that the peculiar richness of Parmesan cheese is attributed to the Italian rye grass which attains to the highest perfection in Parma, as well as elsewhere under irrigation, in the fertile and highly cultivated valley of the river Po.

In a recent report of United States Vice-Consul Crain, dated from Milan, on dairy in Italy, he describes the process of making the various famous Italian cheeses, and shows how extensively they are exported to all parts of the world. Of the Gorgonzola cheese, he says that it sells at twenty cents per pound where it is made, and also that this famous cheese took the prizes last year at London, Paris and Florence. Mr. Crain says, abruptly, that "it's excellence is due to the healthy and aromatic plants, which abound" in the region where it is made. The poet says of another famous cheese:

> "The milder Switzer hath a flavor
> Of marjoram and mountain thyme,
> An odoriferous Alpine savor
> You almost hear the cow bells chime."

That the flavor and savor of the food on which animals are fed permeates the flesh, the fat and the lacteals, is not doubted any more than that the rich flavor of the butter and cheese of some localities owes its good quality as much to the herbage on which the cattle are

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fed, as it does to any manipulation in the dairy, be it ever so skillful and careful. The farmers on the Schuylkill and elsewhere in eastern Pennsylvania, do not doubt that the rich aroma of their butter is in a great measure to be attributed to the sweet grasses growing in favorable localities on their lands. No city on this continent is supplied with better butter than is the city of Philadelphia.

The *pre sali*, or salt meadow taste of the Normandy coast mutton, so much liked by European epicures, the delicious aroma and flavor of Welsh mutton, and the fine flavor of the Georgia Islands lamb and pork, are all to be attributed to the herbage on which the animals are fed. The severity of our winters will not permit the perennial growth of marjoram, thyme and many other aromatic herbs on which the cattle of England, and some other European countries, delight to browse, yet kind nature is ever ready with her adaptations and her compensations; there is, therefore, no reason why the herbage in the meadows and pastures in the grazing grounds of New York should not be improved, if we only set to work earnestly, and introduce grasses that are of known good quality, and hardy enough to be adapted to our climate.

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REPORT ON CERTAIN INDUSTRIES CONNECTED WITH THE AGRICULTURE OF THE COUNTY OF OSWEGO.

BY DEWITT C. PECK,
Secretary of the Oswego County Agricultural Society.
[From the report of the Society for 1881.]

DAIRY PRODUCTS.

Since the general introduction of the factory system of making cheese, very little butter more than would suffice for home consumption has been made in this county, at least the amount would bear a very small proportion to that exported twenty years ago. During the past season many of our cheese factories have begun to make creamery butter, but the per centage as compared with former years it would be difficult to give. This is eminently a cheese producing county.

STRAWBERRY CULTURE.

The growing of strawberries for market has for three or four years past been attracting considerable attention, especially in those towns of this county bordering upon lake Ontario.

A strawberry growers' association has been formed, with headquarters in the city of Oswego, and through this organization, much has been done in the way of finding the best markets, securing special strawberry express trains and favorable rates upon the railroads, improving the yield by better modes of culture introduced, and the character of shipments by improved methods of packing, careful picking, assorting, and in other ways such as almost always proceed from intelligent organization.

We extract from an Oswego paper the following item, published near the close of the strawberry season of 1881:

"The total value of the county strawberry crop this year was about $56,000. There were over 20,000 crates shipped to different points, or 800,000 quarts."

The above includes only the shipments made through Oswego and the association; very many were consumed in the villages of the county, and some sent to near-by cities of which no record has been kept.

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Sorghum Mills.

There are now in the county several mills with the latest improved appliances for the manufacture of molasses from sorghum, and increased attention to that crop is now given. The average is increasing rapidly, and we think the yield of cane of this year per acre to be nearly equal to that of last or any former year; we are informed, however, that the yield of juice from the canes is somewhat less than last year, and the quality about the same (requiring eight gallons juice for one of syrup).

Pulp Mills.

In the north-eastern and more wooded portions of the county, several pulp mills have been erected during the last two years, and this promises to become an industry of considerable importance to that section.

New Industries.

The great crop of fruit, especially of apples, in the season of 1880, was the means of introducing two new industries, hitherto attracting but little notice among our farmers.

Fruit Evaporators.

Several extensive evaporating establishments were erected, in which the apples were pared, cored, sliced and dried, with great rapidity and efficiency, after undergoing a bleaching process to make the product more attractive in the market. The statistics of this new industry are not now at our command, but such was the rapid increase of these establishments, and their almost uniform success as business enterprises, that the value of the apple crop was very greatly enhanced; and had farmers earlier known that the evaporators would continue to make use of their fruit in the winter months, many thousands of bushels might have been saved and marketed, at fair prices, which in ignorance of such facts were allowed to be frozen and destroyed.

These establishments and the jelly factories, were kept in operation far into January, 1881, and as long as fruit could be obtained.

Toward the last of their operations, these evaporating enterprises paid as much money per bushel, in bulk, for good fruit from the farmer's cellars, and even for that taken from straw covered heaps in the orchards, as the best hand picked varieties would bring for shipment to eastern markets.

Thus, to the farmer convenient to them, the trouble and expense of packing were wholly saved, and fruit shaken or blown from the trees, if not seriously injured, was marketable.

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JELLY MANUFACTURE.

There are now five jelly factories in operation within the county. The failure of the apple crop, for some singular and unexplained reason, does not extend in great degree to the natural, or ungrafted, fruit. Though not so many as common, even of these apples, there are yet enough to keep these five mills and the numerous cider mills pretty well employed.

The largest jelly factory is located near the village of Mexico, and as there are some features in regard to this manufacture, peculiar to this establishment, which may be new and interesting, we will undertake a brief description.

The factory is located on the Salmon creek, which affords the necessary power. A portion of the main floor, first story, is occupied as a saw mill, the slabs furnishing fuel for the boiler furnace connected with the evaporating department. Just above the mill, along the bank of the pond, and with one end projecting over the water, are arranged eight large bins, holding from five hundred to one thousand bushels each, into which the apples are delivered from the teams. The floor in each of these has a sharp pitch or inclination toward the water, and at the lower end is a grate through which the fruit is discharged when wanted, into a large trough half submerged in the pond.

PREPARATION OF THE FRUIT AND EXTRACTION OF THE JUICE.

Upon hoisting a gate in the lower end of this trough, considerable current is caused, and the water carries the fruit a distance of from thirty to one hundred feet, and passes into the basement of the mill where tumbling down a four foot perpendicular fall into a tank, tight in its lower half, and slatted so as to permit the escape of water and impurities in the upper half, the apples are thoroughly cleansed from all earthly or extraneous matter. Such is the friction caused by the concussion of the fall, the rolling and rubbing of the apples together, and the pouring of the water, that decayed sections of the fruit are ground off, and the rotton pulp passes away with other impurities. From this tank the apples are hoisted upon an endless chain elevator, with buckets in the form of a rake-head with iron teeth, permitting drainage and escape of water, to an upper story of the mill, whence by gravity they descend to the grater. The press (Boomer & Boschert's patent) is wholly of iron; all its motions, even to the turning of the screws, being actuated by the water power.

The cheese is built up with layers inclosed in strong cotton cloth, which displaces the straw used in olden time, and serves also to strain

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the cider. As it is expressed from the press-tank, the cider passes to a storage tank and thence to the defecator. This defecator is a copper pan eleven feet long and about three feet wide. At each end of this pan is placed a copper tube three inches in diameter, and closed at both ends. Lying between and connecting these two, are twelve tubes also of copper, one and one-half inches in diameter, penetrating the larger tubes at equal distances from their upper and under surfaces; the smaller being parallel with each other, and one and one-half inches apart. When placed in position the larger tubes which act as manifolds, supplying the smaller with steam, rest upon the bottom of the pan, and thus the smaller pipes have a space of three-fourths of an inch underneath their outer surfaces.

The cider comes from the storage tank in a continuous stream about three-eighths of an inch in diameter. Steam is introduced to the large or manifold tubes and from them distributed through the smaller ones at a pressure of from twenty-five to thirty pounds per inch. Trap valves are provided for the escape of water formed by condensation within the pipes.

The primary object of the defecator is to remove all impurities and perfectly clarify the liquid passing through it.

All portions of pomace and other minute particles of foreign matter, when heated, expand and float in the form of scum upon the surface of the cider. An ingeniously contrived floating rake drags off this scum and delivers it over the side of the pan. To facilitate this removal, one side of the pan, commencing at a point just below the surface of the cider, is curved gently outward and upward, terminating in a slightly inclined plane, over the edge of which the scum is pushed by the rake into a trough and carried away.

A secondary purpose served by the defecator is that of reducing the cider by evaporation to a partial syrup of the specific gravity of about twenty degrees Baume. When of this consistency the liquid is drawn from the bottom and less agitated portion of the defecator by a syphon, and thence carried to the evaporator which is located upon the same frame work and just below the defecator.

Evaporator.

The evaporator consists of a separate system of six copper tubes, each twelve feet long and three inches in diameter. These are each jacketed, or inclosed in an iron pipe of four inches internal diameter, fitted with steam-tight collars so as to leave half an inch steam space surrounding the copper tubes. The latter are open at both ends, per-

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mitting the admission and egress of the syrup and the escape of the steam caused by evaporation therefrom, and are arranged upon the frame so as to have a very slight inclination downward in the direction of the current, and each nearly underneath its predecessor in regular succession. Each is connected by an iron supply pipe, having a steam guage or indicator attached, with a large manifold, and that by other pipes with a steam boiler of thirty horse power capacity.

Steam being let on at from twenty-five to thirty pounds pressure, the stream of syrup is received from the defecator through a strainer, which removes any impurities possibly remaining, into the upper evaporator tube; passing in a gentle flow through that, it is delivered into a funnel connected with the next tube below and so, back and forth, through the whole system. The syrup enters the evaporator at a consistency of from twenty to twenty-three degrees Baume, and emerges from the last tube some three minutes later at a consistency of from thirty to thirty-two degrees Baume, which is found on cooling to be the proper point for perfect jelly. This point is found to vary one or two degrees, according to the fermentation consequent upon bruises in handling the fruit, decay of the same, or any little delay in expressing the juice from the cheese. The least fermentation occasions the necessity for a lower reduction. To guard against this, no cheese is allowed to stand over night, no pomace left in the grater or vat, no cider in the tank; and further to provide against fermentation a large water tank is located upon the roof and filled by a force pump, and by means of hose connected with this each grater, press, vat, tank, pipe, trough or other article of machinery used can be thoroughly washed and cleansed. Hot water instead of cider is sometimes sent through the defecator, evaporator, etc., until all are thoroughly scalded and purified.

If the saccharometer shows two great or too little reduction, the matter is easily regulated by varying the steam pressure in the evaporator, by means of a valve in the supply pipe.

If boiled cider instead of jelly is wanted, for making pies, sauces, etc., it is drawn off from one of the upper evaporator tubes, according to the consistency desired; or can be procured at the end of the process by simply reducing the steam pressure.

MIXER.

As the jelly emerges from the evaporator it is transferred to a tub holding some fifty gallons, and by mixing a little therein any little

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variations in reduction or in the sweetness or sourness of the fruit used are equalized. From this it is drawn through faucets, while hot, into the various packages in which it is shipped to market.

PACKING.

A favorite form of package for family use is a nicely turned little wooden bucket with cover and bail, of two sizes, holding five and ten pounds respectively. The smaller packages are shipped in cases, for convenience in handling.

PRODUCT.

The present product of this manufactory is from 1,500 to 1,800 pounds of jelly each day of ten hours. It is calculated that improvements now in progress will increase this to something more than a ton per day. Each bushel of fruit will produce from four to five pounds of jelly, fruit ripening late in the season being more productive than earlier varieties. Crab apples produce the finest jelly, sour crabbed natural fruit makes the best looking article, and a mixture of all varieties gives most satisfactory results as to flavor and general quality.

SAVING APPLE SEEDS.

As the pomace is shoveled from the finished cheese it is again ground under a toothed cylinder, and thence drops into large troughs through a succession of which a considerable stream of water is flowing. Here it is occasionally agitated by raking from the lower to the upper end of the trough, as the current carries it downward, and the apple seeds becoming disengaged drop to the bottom, into still water, while the pulp floats away upon the stream. A succession of troughs serves to remove nearly all the seeds.

The value of the apple seeds thus saved is sufficient to pay the daily wages of all the hands employed in the whole establishment.

The apples are measured in the wagon box, one and a-half cubic feet being accounted a bushel.

EMPLOYES.

This mill ordinarily employs about six men. One general superintendent, who buys and measures the apples, keeps the time books, attends to all the accounts and the working details of the mill, and acts as cashier; one sawyer, who manufactures lumber for the local market and saws the slabs into short lengths suitable for the furnace; one cider maker who grinds the apples and attends the presses; one jelly maker who attends the defecator, evaporator and mixing tub,

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besides acting as his own fireman and engineer; one who attends the apple seed troughs and acts as general helper, and one man-of-all-work to pack, ship and assist whenever needed.

The establishment is owned by George B. Bloomer, of New York, who is also the inventor of the defecator, evaporator and much of the other machinery in use. It was erected late in the season of 1880, and manufactured that year about forty-five tons of jelly, besides considerable cider exchanged to the farmers for apples, and some boiled cider.

PRICE AND CONSUMPTION OF FRUIT.

The price paid for apples in 1880, when the crop was superabundant, was six to eight cents per bushel; in 1881, fifteen cents. Mr. Bloomer hopes next year to consume 100,000 bushels.

These institutions are important to the farmer in that they use much fruit, nor otherwise valuable and very perishable. Fruit so crabbed and gnarled so as to have no market value, and even frozen apples if delivered while yet solid, can be used. Such apples are placed in the water while frozen, the water draws the frost sufficiently to be grated, and passing through the press and evaporator before there is time for chemical change, they are found to make very good jelly. They are valuable to the consumer by converting the perishable, cheap, almost worthless crop of the bearing and abundant years, into such enduring form that its consumption may be carried over to the years of scarcity and furnish healthful food in cheap and pleasant form to many who would otherwise be deprived, and lastly they are of great interest to society, in that they give to cider twice the value for purposes of food, that it has or can have, even to the manufacturer, for a use as a beverage and intoxicant.

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EXPERIMENTAL OBSERVATIONS ON THE POTATO.

By E. LEWIS STURTEVANT, M. D.,
Director of the New York Agricultural Experiment Station.

A generation ago potatoes seem to have been raised without difficulty and large crops were the rule rather than the exception. At the present time the potato is grown less readily, and large crops are the exception rather than the rule. A generation ago the tuber was large and coarse as compared with our modern varieties, and the plant bore seed balls in abundance, but the modern potato is far superior in quality to the potato of our father's boyhood, and the plant has ceased to be generally fruitful in seed. We seem to have in these statements an illustration of the general law that nature spares in one direction in order to spend in another. With improvement in quality comes less fruitfulness in seed; with poor quality may come abundance of tuber and abundance of seed. As the potato tuber became of very fine quality the plant in its turn changed, showing less resistance toward unfavoring circumstances and calling for more attention on the part of the cultivator to support it in its artificial condition. In a word, the potato has become domesticated. In order now to obtain favorable results we must recognize the domesticated condition, and by a study into the habits of the plant, habits derived through heredity as well as through environment, to search after a knowledge of the present needs of the plant in order that we may supply to it those artificial conditions which shall give the most encouragement toward large and fair yield.

Commencing then with the tuber we may ask ourselves what do we already know from the Station data.

First. The tubers are borne upon underground branches, either at the apex or in the axils of rudimentary leaves, and these tubers are formed only on these underground branches and never on the true roots.

Second. These underground branches may be short, thus bringing the potato tuber very close to the true stem, and in variations may even appear stemless on the one hand, or possess a long one on the other. In cases, as when the potato seems to be irregularly formed

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with projecting nodules, these nodules seem really perfect potatoes, the stem being obliterated and the two potatoes, as it were, becoming grafted together.

Third. The underground stems, which have already formed small tubers at their extremities, will, by being exposed to the light, change the course of their development, and from the tuber as a bud, branches will issue, and what was to have become the potato, ceasing development, becomes a portion of a stem. When the potato has attained nearly its full size, exposure to light not only gives it a green surface, but also seems to favor the development of nodosities, which in turn originate shoots of active growth.

Fourth. A potato whose eyes have been injured and upon which small tubers have already formed may not be able to vegetate and yet may have the power of transferring through a process of growth (while yet buried, without any appearance of vegetation), its own nutriment into new potatoes, which increase in size as the seed becomes disorganized.

Fifth. Under normal conditions the tuber is formed and grows within the upper few inches of the soil above the true roots, while the roots occupying the space below the tuber penetrate the soil to a considerable depth.

Sixth. In some few instances where the roots of the potato plant occupied a soil whose temperature was maintained at the same temperature as the atmosphere, tubers did not form, but the same plants being removed to the ground immediately occupied themselves in the formation of tubers.

Seventh. When a whole tuber was planted, rarely over three or four eyes developed into shoots, provided the eyes were uninjured; when, however, the eyes of the potato were injured by the application of scalding water, a large number, even up to thirty or more shoots to the eye, became developed, and each eye of the potatoes sent out its shoots. Where the scalding process was carried a little further, small potatoes, even up to twenty-five in number, were developed at each eye in the place of, or intermixed with, shoots. Where the scalding process extended a little further, stems developed below the surface of the potato, penetrating its surface, became swollen, emitted underground branches, which in turn bore potatoes at their extremities, thus offering the phenomenon of potatoes within the potato, without appearance of vegetation. When potatoes from which the eyes had been carefully removed were split in halves and the halves planted, these remained dormant within the ground for a long time without

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rotting and without any appearance of decay until finally callosities, in some cases taking on the appearance of tubers, appeared upon the cut surfaces where the eyes had been removed, along the cambium region of the tuber, and even upon the central portion of the tuber, thus indicating that the vital points of the tuber while strongest in the region of the eye and in the cambium region, are yet quite generally disposed throughout the substance.

Eighth. Where potato skins were planted the whole substance of the seed became absorbed into the growing potato. When, however, whole potatoes were planted the line of absorption rarely, if ever, followed the cambium region, but if the examination was made before the complete breaking down of the tissues the absorption seemed to offer definite lines and to be confined to a definite region. In some cases, however, no absorption took place and the seed potato remained unchanged in form and solidity up to the time when the new potatoes were fit to be eaten.

Ninth. When a slice which bisects several eyes is taken from a tuber and this slice is then soaked in a solution of carmine in weak aqua ammonia, there becomes visible a certain structure of the tuber which may be described as a central axis, extending from the stem to the terminal eye, and connected with the other eyes by branches. An application of iodine to the cut surface also develops the fact that these portions which we, for convenience, call stem and branches, contain less starch than do the intervening regions, while a microscopic examination also shows that these are composed of vascular tissues rather than starch cells.

Tenth. Under conditions, as yet scarcely understood, fair potato tubers form in the axils of the leaves of the stem, in the light; often at each axil.

These facts of structure seem to suggest that the strongest vegetative point of the potato is in the eye; that an important vegetative zone is defined by the cambium region, while, moreover, the extension of the vegetative zone of the eye below the cambium region also exerts an influence upon the growth of the eye, and that while each eye rules in a measure over its own territory, yet it is in a measure subordinate to the aggregate of the eyes which we define as the whole potato.

A line of investigation based upon these reasons gathered from structure, has this year given us surprisingly uniform results and has developed facts of great interest to the cultivator. Our plan has been to dig the potato plant at various and frequent intervals from planting

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to maturity, and by careful noting of the appearances found, and by a careful grouping of uniformities, to seek out the relationships between practice and theory. A general summary of our season's experience is that the method of cutting the potato is one of the most important factors which we possess that bear upon yield. We have noted that there was less influence to be ascribed to the amount of potato used for seed than to the method in which the seed was cut. We have noticed that, as between single eyes cut improperly and the whole potato used as seed, the advantage of yield was with the whole potato, but that when the comparison of the whole potato used as seed was made with eyes properly cut, then the advantage became manifestly in favor of the single eyes; that when the produce of eyes cut shallow was compared to the yield as between hills, the yields were surprisingly uniform. The same may be said where eyes were cut deeper within the substance of the potato, and where variation occurred the yield was in favor of those eyes which were cut the deepest within the substance of the potato. When half potatoes were used for seed and the comparison made between the product of the two halves, in those cases where the vegetating eye happened to be cut shallow the yield was markedly inferior to the corresponding eyes which deeply penetrated the seed. We feel, therefore, safe in announcing, as the result of this year's experimenting, that all our observations are favorable to the belief that in using single eyes cut so as to include the whole vegetative zone, which we have seen penetrates within the substance of the potato, we are securing results superior to those gained from any system of cutting which may be made at random, or from the use of the whole potatoes themselves as seed.

Several curious circumstances which may have a bearing upon the profitable growing of potatoes may also be mentioned. One is that where shoots were broken off and planted, in no case did the terminal point of the shoot continue its growth and furnish a plant, but a bud, formed in the axil of the leaves, pushed to the surface and furnished the foliage. From this bud underground stems issued early and formed tubers, which as late as June 12 were superior in size to the potatoes from seed used in the ordinary manner; but soon growth ceased and these premature formations became left behind. Which of the buds that started into growth from these shoots seemed also to influence the crop. When whole potatoes were planted in different ways the earliest formation of tuber varied considerably. In some the tuber formed early; in others later; in some a few of the tubers grew apparently at the expense of the formation of additional

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tubers, and then, perhaps, becoming changed by our examination, additional tubers became formed at a far later stage. When the shoots from the three or four eyes which vegetated were broken off, then every remaining eye threw out its shoot, and these shoots in no one case seemed as prolific in formation of tuber as our single eyes planted in a similar manner.

It might naturally be supposed that where but a single eye developed from a whole potato, the yield would be superior or at least equal to that from a single eye planted in like manner, and yet, curiously enough, we have no facts to offer which would substantiate this belief. We can but suggest that as injury to the eye in the case of the scalded potato developed in some cases the formation of tuber rather than of stem, so in some as yet unexplained manner the cutting of the eye, promoting a disturbance of the vegetative zone of the cambium, had an influence in causing the formation of tuber in preference to the formation of stem.

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POULTRY AS A FARM PRODUCT.

An address before the New York State Agricultural Society,
BY MR. I. K. FELCH,
Of Natick, Mass., at Utica, September 26, 1882.

It has been my privilege and pleasure to act for three successive years as your judge on poultry, and I am happy in being able to say that your exhibit at Albany three years ago, was the very best I ever saw at any State agricultural association. To-night, by invitation of your secretary, I will in a few remarks introduce the question, *Poultry as a farm product*, for as an item in our trade and commerce it is immense, and deserves well your candid consideration. In consulting the reports of the commissioner of agriculture, I find the following interesting statistics in relation to the crops for 1879:

Our corn crop has increased over fifty per cent since 1870, and now aggregates over 1,548,000,000 bushels, valued at $580,486,217.

Our wheat crop reaches the snug total of 449,000,000 of bushels, with a value of $497,030,142, the increase being not quite fifty per cent.

The hay crop is estimated at 55,493,000 tons, with a value of $331,000,000, showing an increase in tonnage, but a slight falling off in value.

The cotton crop has increased from $138,000,000 to $242,141,000.

The cattle, sheep and swine slaughtered and sold to be slaughtered were valued in 1870 at $399,000,000. To estimate an increase in keeping with the increased population and increased export trade, we say $500,000,000 to be a fair estimate for 1879.

These large sums show the enterprise of our farming population.

But our census makers have left out the grandest product of them all, and as we make an estimate of the egg and poultry interest I trust we may find a product that will compare favorably with any of the foregoing.

We have nearly 11,000,000 families that consume two dozen eggs per week and twenty dollars' worth of poultry per year, which if we compute eggs at twenty-five cents per dozen, gives us in this one item $506,000,000.

The encyclopedias give us the hotel consumption at sixty-two to

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sixty-eight millions, and when we add to this the restaurant, saloon, the chemical and medicinal consumption, and that in the way of manufacture, I fear no denial when I assert as a fact the egg and poultry production and consumption for the United States to be $600,000,000; and when I say that the Empire State controls by purchase and sale twenty per cent of this large industry, you must see its relative importance to you, and how it might or should affect you in making it one of the prime industries upon your farm. You may not heretofore have considered it, but surely we have in it the largest agricultural interest and product. I imagine I hear some say that you do not realize the price per dozen for your eggs, or are aware of this large family consumption quoted. In answer I say that the average price for eggs on the Pacific slope exceeds fifty cents per dozen; the average for 1881 in Natick exceeds thirty cents, and if you will take the pains to examine into it you will see my estimate is low. While the common practice of farmers in the prairie districts and remote counties of packing poultry in snow and in ice in early winter for use till spring, and and the immense consumption by them in summer as fresh meat, coupled with the wealthy, who consume much more than the average I quote, will more than make up for the poor who eat poultry as a luxury.

I clip from a paper the following: "The egg and poultry shipment from Vineland, N. J., for the year ending April 1, 1882, was 208,000 dozen eggs and 52,000 pounds of poultry, shipped by rail, while large quantities were bought by dealers and were shipped from other points. The value of the above was about $65,000. The home consumption and the amount shipped other than at this station must have carried the amount way above $100,000 for that one town."

Two years ago Coney Island took 10,000 broilers per day during the summer season, and last season it was augmented to 12,000 per day, which, at four pounds to the pair, sums up 24,000 pounds; and as some of the hotels contracted at sixty cents per pound, it is a low enough estimate when we say fifty cents, or $12,000 per day, or $720,000 for the season of sixty days at that one resort.

The consumption is yearly increasing, and the quality and price increase in a like ratio. One bushel of corn will grow as many pounds of live poultry as it will of pork. Thus does it establish the fact that it will pay you far better to feed it to fowls than to swine. One bushel and twelve quarts of sound corn, or its equivalent in other grain, will keep a fowl a year. And that the average hen will lay you ten and one-half dozen of eggs per annum makes it certain for you to secure a

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profit of $1.20 to $1.75 per head, according as the price of eggs and poultry and grain are affected by the markets of your locality.

When kept in large numbers and penned, in groups of twenty to thirty, in coops of 12x12, and yards of 12x60 feet, they have the past year, at this disadvantage, produced nine dozen of eggs each, and the eggs have been sold on a yearly contract at thirty-two cents per dozen.

Farmers should, in all branches of industry, operate largely enough to secure the best results in price. It is not my object to convert them into poultry farming exclusively, yet he who has planted an orchard has by no means finished his work until he shall have furnished quarters in the same for 150 to 200 fowls to the acre, making it serve the double purpose of orchard and poultry yard. This is well done by constructing houses 15x30 feet, with "lean-to" sheds at each end, 10x15 feet, the houses divided by close partitions, and fences running from the front of one to the rear of the other, each house then furnishing quarters for two colonies of fifty fowls each, and by the fences from one to the other dividing the orchard into half-acre fields, in each of which 100 fowls are roaming to destroy all slug borers, curculios and insects injurious to the trees, while the droppings are being absorbed as fertilizers by them. These open sheds are of great importance, for fowls like to bask in the sun and open air daily. And it seems necessary, if we would be sure of eggs hatching well in winter and early spring, that these sheds should have the ends constructed in the way of doors, exposing the shed from the south in winter and the north in summer. Thus can the same be made cool in summer and warm in winter. A fowl's heart beats 150 times per minute, while it never perspires; thus does it suffer in extreme warm weather, making a cool retreat important if we would secure the greatest profit. These houses, placed from eight to ten rods apart, will secure the fowls from the epidemic that sometimes visits them when kept in large numbers, and also will it secure the fowls roosting in their own quarters, and the plan saves much fencing.

As a rule farmers do not keep fowls in such numbers as to cause them to investigate as to their real profit, or enable them to contract for a steady supply of eggs and broilers for the market. But when it is done the best prices and surest paying patronage are the result. With 250 fowls, and the raising of 500 chickens for broilers for June, July and August, the farmer can contract readily with the poulterer, who will come to his door twice a week for his eggs and poultry, eggs, and poultry being no longer a barter trade, for agencies are established throughout the country. And the cash comes in for it as regularly

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and certainly as it does for pork or beef. The fanciers of poultry have done much for your benefit, for through their enthusiasm, their lavish expenditure of money, their poultry exhibitions, the importation of thoroughbred stock, the extra care of the same, the stock of the country is to-day fifty per cent better in quality, the egg production twenty-five per cent greater *per capita*, and in consequence of this toning up of the interest we realize a higher price, and the product has been converted into a cash article of commerce. What farmers have done farmers can do again. And with examples before us, no one can with grace decline doing well because others have, through mismanagement, failed.

In reading the agricultural report of the Middlesex South Society of Massachusetts, I find, in 1858, one farmer, whose thirty-eight fowls, kept in small yards, under unfavorable circumstances, with a market at eighty-eight cents for corn, sixteen and two-thirds cents for eggs, and fifteen cents per pound for poultry, yielded a net profit of $1.38 per head. In 1861, in Mr. Mansfield's experiment, 100 hens, having a free range of the farm, consuming but ninety-three bushels of corn, or its equivalent, produced 147 eggs each (no chickens being raised in that year), and yielded a net profit on eggs alone of $1.35 per head, to which, had the value of the manure been added, the profit would have reached the sum of $1.60. These and other statements of $2, $2.25 and $2.50 per head profit per annum are to be found in the Middlesex South Society's reports; and last, but not least, the banner statement of Mr. Whitman in 1873. With fifty-one Leghorns, which laid 207 eggs each, sold for thirty-one cents per dozen, the cost of keeping the fowls being $1.13 each, he shows a profit of $4.04 per head, proving conclusively that with care poultry pays much better than other farm stock. Poultry culture is by no means hard work, and can be conducted by the younger members of the family, and the money may go a long way toward paying for the heavy work of the farm. If you will place 250 fowls in the hands of a farmer lad of fifteen to seventeen years of age, with the understanding that he is to raise 500 chickens, thereby making good the number of pullets in the fall, having 250 broilers and 250 old fowls for sale per year; exacting no other work from him, he taking his pleasures when his work is done, you by no means interfering with those pleasures so long as they are proper; charging him with all grain and expenses, and giving him credit for *all* eggs and poultry used in the house or sold, you will find ere long that the lad takes more pleasure in his business than his play, and becomes more business-like in his habits, being "a man among men."

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Give him the books and papers that treat upon the feeding and raising of poultry, which, with his daily experience, will work out for you a greater profit, when the amount of money invested is considered, than many another industry you now are well satisfied with. Put in his hands a table like the following, which gives the composition and time of digestion of the different kinds of grain and meat:

FOOD.	COMPOSITION.			Time of digestion.
	Muscle.	Fat or heat.	Bone.	
	Per ct.	Per ct.	Per ct.	Hours.
Oats	17	69	3	3
Barley	14	68	2	2
Rye	13	66	1	3
Wheat	13	66	1	3.30
Corn	11	75	1	3.15
Rice	7	92	1	1
Sago	4	82	1	1.45
Beans	23	63	3	3
Potatoes	2	23	1	3.30
Milk	5	3	1	2.15
Bacon	8	63	1	4
Fish	14	7	1	3
Beef	22	14	1	3
Lamb	20	16	1	2.20
Sugar	....	100	....	3
Fat	....	100	....	5.30

With such a list he will soon learn to make a food composed of fifteen pounds of oats, twenty pounds of corn, ten pounds of barley and ten pounds of wheat bran, having the same ground into a meal, and making it into bread as we make corn bread for breakfast, crumbling the same into scalded skim milk for his chickens, which at twelve weeks old will be a full pound larger than when fed in the old way. He will learn also that what will conduce to the greater growth in chickens will produce the greater number of eggs from the laying stock, and that the feeding of this composition, thoroughly scalding it, for the morning feed, is excellent for the purpose. Why simply in this composition he has fourteen per cent of muscle, two per cent bone and sixty-eight per cent fat, being most perfectly balanced in these respects. He learns that beans are desirable to add to this composition when they can be purchased at $1.50 per bushel or less, then adding an extra ten pounds of beans and an extra ten pounds of corn before the grinding of his bread-making material.

He learns that, when his chickens are well grown, to feed them for

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eight days for the morning and noon meal on a food composed of eight quarts of corn meal, two quarts of pork scraps and two quarts of barley meal well cooked, with corn at night, and crushed charcoal kept within their reach, will fat them fit for a king or the first citizen of America to eat. This fattening process is promoted by keeping the fowls in a coop that can be darkened for a couple of hours after each feeding.

When the price of corn or other causes make it desirable to feed largely of corn to growing chicks or laying hens, it is well to feed also of fish, or sheep's haslets, in the way of meat, and if the meat cannot be secured, wheat bran should be used in equal bulk with corn, for the muscle and bone property in the hull of the wheat makes it the best of companion feed with corn for fowls.

The usual meat supply, to secure it at a very low price, is found in the beef scraps, beef and sheep heads and haslets and fish. Pork scraps are worthless as egg producing or muscle-growing food, and should be used only in severe cold weather, when heat is essential, and for fattening the stock for the shambles, long continued feeding of them invariably breeding disease in the flock.

While potatoes are excellent as a regulator of the bowels, and to feed two or three times a week, they are not desirable to feed oftener at anything over twenty per cent of the cost of corn.

Are the farmers of this association ready to try this experiment? If so, give the boys one coop at least of fowls that are their especial favorites, even if they be a superb game cock and his harem of hens, and let him breed these pure in blood for sale as breeding stock -- for in all classes of stock on the farm it is well to breed so that the finest specimens can be sold for breeding purposes at larger prices than for mere food. This encourages the breeder and more deeply interests him in his calling, and in this case gives your boy a fair chance in his comparison of enterprise with you.

But to select from among those breeds best fitted for this egg and meat supply, we say among the so-called thoroughbred fowls of the large size, the Light Brahma, Langshan and Black Cochin; among those of the medium size, the Plymouth Rocks, Wyandottes, Houdans and Dominiques; and among those of the smallest and fit only for egg production, the Leghorns, the white variety being my preference.

The three breeds I would select, if to confine myself to thoroughbred stock, would be Light Brahmas, Plymouth Rocks and White Leghorns. But were I to give up all save those from which I could secure the very best results in eggs, broilers and roasting fowls, I would

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keep fine Light Brahma hens in numbers that, mated to a White Leghorn cock, would lay eggs enough for my incubating purposes — the laying stock, broilers and poultry thus being a cross-bred Brahma and Leghorn. They will lay the best in all seasons of the year, and while the eggs are larger and generally dark colored, the hens lay as do the pure Leghorns, while the poultry is as nice as can well be. There will be enough among them that will become broody in the whole, and we get rid of much annoyance often experienced from sitting hens.

With care you investigate the difference between soiling and pasturing cattle, you test the difference between the two systems of feeding steamed or dry food. You exact that your laborers be gentle with, and create no nervous excitement in, your milch cows, and that they do the milking quietly and with dispatch, that the very best results in milk and butter may be attained. Have you in a like manner experimented with poultry and have found it not to pay? We fear not. To you and to those who have condemned poultry as a farm product on hearsay testimony, we say give the poultry a fair trial, investigate and foster an industry that will surely pay.

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SILOS AND ENSILAGE.

A Paper read at the Annual Meeting of the New York State Agricultural Society,
By HENRY E. ALVORD,
Of Houghton Farm, Orange County, January 17, 1883.

It seems a pity that the plain English words, pit, pitting and pitted, were not at first adopted in connection with this, to us new system of providing cattle with succulent forage throughout the year. The term "pitted rye," or "pitted clover" would now be fully understood. But new things create new names, and the words adopted from the French are now so generally used that when considering this subject we must talk about *silos* and *ensilage*. (We need not, however, attempt the French pronunciation.) The word *silo* can be traced across Europe, and its equivalent found in the Roman, Greek and even Persian languages, in all applied to an underground excavation or pit used for the storage of grain and green crops. The pits thus used in early times as described by a number of ancient writers, had the essential requisites of the modern silo, drainage, dryness and perfect exclusion of the air.

The knowledge of this method of preserving green forage came to the present agriculture of Europe in a manner unknown, but it was practiced in Hungary at the beginning of the present century, and in Germany not many years later. Excellent descriptions of the process were published in East Prussia in the year 1842, and similar accounts exist of its application in Spain, France and Mexico, various vegetable products being thus preserved, including the leaves of trees and vines. In Germany it was especially useful in keeping beet leaves and beet pulp in connection with the sugar industry. In France it was mainly used in the same way until a beet sugar manufacturer, near Stuttgart, apparently by accident, applied it to maize about the year 1855. The experiments of Auguste Goffart came a little later, and it was through the attention his efforts attracted that the silo, as we now know it, was introduced into the United States.

In the year 1873, and again in August, 1874, a description of the Hungarian method of making "sour fodder," in the crude trench form, appeared in The American Agriculturist. The same journal

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published, in June, 1875, an illustrated account of the European experiments with ensilage, based upon reports in the *Journal d'Agricultare Pratique* of Paris. The report of the United States Department of Agriculture for 1875 contained (pp. 397–408) a full description of "The French Mode of Curing Forage," its origin, the silos, the usual methods of cultivating crops for and of making the ensilage, effects of fermentation in the silo, and the value of ensilage in stock feeding.

The general principles of the silo were applied to the preservation of different products in numerous places in America between 1870 and 1880. At the Illinois Industrial University broom-corn seed and the green corn plant, whole, were kept in this way for months. In 1877, under the title of "An American Silo," a dairy barn in Westchester county was described and illustrated in a farm journal, the special feature of which was a cellar or pit constructed for storing brewers' grains and preventing their fermentation and decay by pressure and exclusion of air. Thus we had the means of knowing something on this subject, had its importance been realized, before the special results of Goffart's work. The latter published his book on "The Ensilage of Maize" in 1877. This work was noticed in a paper read by ex-Governor R. M. Price, of New Jersey, on the 6th of December, 1878, at the International Dairy Fair in New York city, and subsequently printed in the Fair "proceedings." The subject attracted attention at once, and was discussed with interest by the farmers and dairymen present, being undoubtedly the first time that ensilage occupied the attention of any public meeting in America. That was only four years ago. Since then several books on silos and ensilage have been published in this country, besides the very general discussion of the merits of the system by the agricultural press.

The first person in the United States who built silos and made corn ensilage for cattle food as a regular part of his farming operations was Mr. Francis Morris, of Oakland Manor, Howard county, Md. He saw an account of the process in a French newspaper in the early part of 1876, at once opened correspondence with Mr. Goffart, and that same year raised five acres of corn in drills and preserved it in silos. The following year he repeated the trial. It was this experience of Mr. Morris that was given at the New York Dairy meeting, as above mentioned. From this beginning the system has rapidly spread in America, and there are now hundreds of silos in use in different parts of the country. A list is published of over 100 in Vermont, and they are most numerous in the Eastern and Middle States. But they are also to be found as far south as the Gulf States and as far west as Nebraska.

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The location, shape and material for any silo should be largely governed by the surrounding circumstances. Silos may be built wholly above the surface of the ground, partly excavated, or wholly underground, and may be of stone, brick, concrete, wood or earth. The structure must be strong enough to hold its solid contents at fifty pounds per cubic foot and the pressing weights added. It should be air-tight and water-tight. Whether it should be so placed as to protect the contents from the action of frosts is still an open question, but ensilage is probably not injured by freezing while under pressure. When equally convenient, however, it is best to place the silo so as to maintain an even temperature of its contents at all seasons. It should be located so as to facilitate filling and also removing the ensilage. It is well to have the bottom on a level with, or not much below, the feeding floor, with a door into the silo from this floor; the door must be made air-tight. The inner walls of the silo must be vertical and their surface smooth, to permit the ensilage to settle evenly in the pit and the cover to follow. A large upper surface is not desirable and the depth should be as much as either length or width and preferably more. Several small silos, independent or connecting, are better than one large one A large and shallow silo of masonry or other strong walls may be advantageously divided into several small and deep ones by putting in plank partitions. It is very desirable to have compartments of such a size that one can be filled, covered and weighted in one working day. A substantial masonry silo, by greater durability and better action, will generally be found true economy, yet cheaper structures, with walls of wood or earth, sometimes do as well. Silos are in satisfactory use built wholly above ground; the walls of two thicknesses of inch boards, on the inside of a strong frame, with and without tarred paper between the boards. Underground silos, if not cement-lined, must be perfectly drained. Successful silos have been made by excavations in a heavy clay soil and in the side of a compact well-drained gravel bank; in these cases the walls are coated with cement, like a cistern, or, if solid, the earth sides left bare. The crude form of silo still in use in parts of Europe is a long narrow trench, with sloping sides; this is filled with fodder and as much more piled above, the whole then banked up and covered closely with earth, which serves both for pressure and sealing. The silos now in use by Mr. Morris on his Maryland farm are substantially of this pattern.

Indian corn, rye, oats, the different millets and clovers, vetches, the cow-pea, sorghum and sorghum seed, broom-corn seed, beet-tops and various grasses have been successfully preserved green, as ensilage.

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But corn is so easily grown and is so much more productive on a given area than all other plants yet tried, that it is *the* ensilage crop of America. This is so fixed that the word "ensilage," used alone, is already understood as meaning ensilage of corn. The large varieties of luxuriant foliage, regardless of grain, are those best for the purpose. The corn is usually grown in drills, three or four feet apart, on highly manured land and thoroughly cultivated during growth. The plant is not cut as young as when the system was first advocated, but allowed to approach maturity, the most favorable time being after the ears have fully formed, but before any part of the stalk dries. Rye makes good ensilage, and, with heavy manuring, a crop of fall-sown rye can be taken from land in time to get a corn crop from the same ground. While the tonnage of green rye from an acre is much less than of corn, the crop is a more certain one, and the plant so much more nutritious, that full as much food from the acre can be obtained in rye as in corn. In practice it is found that the feeding value of ensilage from rye and corn is as to five to nine.

In filling the silo, the fodder, whatever it be, should be cut and taken from the field, without delay, to a chaffing machine placed near the silo and then quickly cut into lengths of not less than one-fourth, nor more than one inch. The chopped fodder should pass at once into the silo and there be spread of even thickness, this being a matter of importance. The tramping down as the filling proceeds, which is generally practiced, is more likely to do harm than good, by creating unevenness in the mass, unless it is done with best of judgment. The fresher the fodder, when it goes into the silo, and the sooner the compartment is filled, the better. No injury is done by having the material quite wet with dew or rain at the time of pitting. In order to have the silo full after settling, there should be an upward extension of the side walls, one-third the depth of the pit, and the filling should be to the top of it. This curb may be temporary and removed after the ensilage has fully settled. Immediately after the silo has been filled a cover of stiff plank should be put on closely fitting, yet just loose enough to prevent catching on the side walls during the settling. Upon the cover apply pressure in any convenient form. The simplest method is by weights, using 150 to 250 pounds to the surface foot; these limits are safe without regard to the depth of the silo. The object of the weight or pressure is to force out air and prevent fermentation, and the weight is only needed for the uppermost six feet of ensilage — all below that depth being sufficiently compressed by the weight of the mass above. There are several devices in use for apply-

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ing the pressure by screws and levers. What is needed is a continuous following pressure — the details are immaterial. Nine-tenths of the settling occurs within sixty hours from the time the pressure is applied.

Harvesting the crop and filling the silo is the main cost of ensilage and it is in this work that the greatest opportunity occurs for system and economy. The location of the growing crop with reference to the silo, and the arrangements for hauling, cutting, storing and pressing, require judgment and skill. Ensilage in the silo costs from one to four dollars a ton, according to the management. The average cost in the United States the past season was about two dollars and twenty-five cents per ton. Ensilage being four-fifths water, the solid substance costs from ten to eleven dollars per ton. This is just about the value of a ton and one-third of good dried corn fodder, which also contains one ton of solid matter. Therefore the cost of preserving a ton of food is just about the same by the two processes, in silo and field curing.

The silo should remain undisturbed long enough for the fermentation to reach its maximum and the whole mass then becomes cooled. In several practical tests the greatest heat has been found between the fifth and tenth day after closing the pit and putting under pressure, and it has required several weeks to cool thoroughly. It is generally from ten to twelve weeks before the ensilage is in good condition for keeping and feeding, and it may be left as many months without injury, if not as many years. In opening, a small part of the cover should be removed at a time and the section uncovered cut down from top to bottom of the silo like a mow of hay. If, by cutting and removal, a new surface is thus exposed every two or three days no decay occurs on the exposed portion. In the case of a deep silo, without an opening in the side, the least exposure is made by removing the entire cover and working downward over the whole surface. Corn ensilage comes out in a moist condition, of a dark greenish-brown color and with a pungent odor and more or less acid taste, usually quite sharp. The extent of the fermentation and the degree of acidity developed vary much with different silos and with successive crops in the same silo. These are points of importance not yet under control and not likely to be until careful investigations throw more light upon the chemical processes of the silo. But by following the course described, the changes can be so controlled as to prevent decay. It may be accepted as a fixed fact, that any plant, good for cattle food when green, may be preserved in a succulent state, as ensilage, and kept in an edible condition throughout the year.

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As a rule all horses, mules, cattle, sheep, swine and poultry are fond of ensilage. Occasionally an animal will be found to refuse it when first offered, but these soon learn to like it and, with the rest, eat it with avidity. Most farm animals prefer ensilage to the best dry forage, and many will eat it rather than good roots, when both are placed before them. The sharp acidity of ensilage fresh from the silo seems unobjectionable to the animal, but if kept loosened up for half a day, the material has less apparent acid, its greenish hue usually brightens and it is then evidently eaten with more relish. That it is very palatable is shown by cattle eating a much greater weight of ensilage per day than of the same plant in its natural green state. A cow or steer of 1,000 pounds weight will often eat 120 pounds, and sometimes 140 pounds, of corn ensilage in a day.

From the many practical results on record, it is plain that corn ensilage cannot be fed alone, with profit, unless it be merely as a maintenance ration. Store hogs have been wintered upon ensilage alone without loss, but the corn plant is an incomplete food, both in its growing state and as ensilage. The best results have been those where ensilage has been fed in limited quantities, forty, fifty and certainly not exceeding sixty pounds per day to 1,000 pounds live weight, and a connection with a liberal allowance of grain to secure the proper nutritive ratio. Many careful feeders prefer that the ensilage shall not constitute the only coarse forage, and so use forty or thirty pounds only, with five or ten pounds of hay added, besides the grain. Some well-conducted trials show most satisfactory results from using ensilage mainly as a condiment, or addition to the usual dry winter diet, and as a substitute for roots. In nearly all cases where ensilage is used as a considerable portion of the daily ration for horses and cattle, but not exclusively, its excellent hygienic effect is apparent in the thrifty appearance and action of the animals, their smooth coats and the healthy condition of the bowels. Like any succulent food, ensilage tends to maintain the flow of animals in milk. In the case of breeding ewes, it has been substituted for turnips and mangolds with good results, and their lambs have learned to eat it sooner than any other solid food. Milch cows, on an ordinary winter diet, usually show a gain in quantity of milk when a portion of ensilage is added to their daily ration, but like results do not follow the entire substitution of ensilage for other coarse fodder.

Errors have arisen from comparing corn ensilage with hay, straw and other kinds of food, even including grain. No such comparison can be justly made, or at least not until ensilage, as a food, has a more

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even quality, so that a standard may be fixed for it. With the present knowledge of the subject, the primary question is as to the effect of this process upon any forage plant thus preserved. What is the feeding value of rye or clover as ensilage compared with the same plant in its growing state or cured as hay? Likewise, corn ensilage must be compared with the green maize, cured corn fodder, or stover, and grain.

With this view of the subject some comparative trials have been conducted in our experiment department at Houghton Farm, Orange county, the results of which will now be given, under three different heads.

I. To ascertain roughly which would hold out the better in feeding, corn and its fodder, field cured, or the matured plant as ensilage.

In a field of ten acres of growing corn, cultivated in hills, two acres were selected and marked off as nearly equal as possible, even to counting of vacant hills. The corn from one acre was ensiloed in September, when the grain was just beginning to glaze, and the next week the crop was cut on the other acre, field cured, and later it was stored under cover, the corn being husked. The crop from one acre weighed 18,910 pounds when put into the silo, nine and one-half tons of ensilage. The harvested crop of the other acre consisted of 3,027 pounds of corn (ears) and 2,982 pounds of stalks, or three tons of dry food. Half the product of each acre was fed to a cow selected for the purpose, the two cows being as evenly matched as possible. The one receiving ensilage was given all she would eat for a week, and the daily allowance, based on the trial, then regulated so as to average seventy-four pounds per day until the supply was exhausted. The half acre crop, as ensilage, lasted 126 days. The other cow was given a fixed daily ration of twelve pounds each of cut stalks and cob meal. The half-acre crop lasted 124 days. There was no more waste in the one case than in the other. Both cows fell off rapidly in their milk, although the one on dry feed did rather the better. Their milk record is regarded as of no value experimentally, since individual peculiarities might account for all the difference. When but one animal is thus used the margin for error is too wide to make any close comparisons. The crop was a light one — twice as much ensilage might be produced on an acre — but the stalks and corn might also be doubled. Taking the equal acres as they stood, their products, preserved in different ways, lasted equally well. Neither cow was fed well enough for an animal in milk. What each one received per day, and what they

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ought to have had, according to chemical examinations of the food, the following table exhibits:

FOOD ELEMENTS.	Dry food. lbs.	Protein. lbs.	Fat. lbs.	Nitrogen free ext. crude fibre and ash. lbs.
In a standard ration	21.50	2.250	.500	11.25 N. F. ext.
In 74 lbs. corn ensilage..	17.95	1.362	.575	13.35 N. F. ext.
In 12 lbs. each stalks and cob meal.....	19 34	1.438	.536	16.83 N. F. ext.

The dry ration appears to have had rather greater nutritive value than the other, yet the difference may have been made up by greater digestibility in the succulent material.

II. To test the effect of keeping a milch cow upon corn ensilage alone.

"Browney," a fair average cow, was selected from a milking herd of fifty "natives." She was five and a-half years old, weighed 847 pounds, and had given about ten quarts of milk a day, with her last calf. She was dried off in October, and kept on hay alone until calving. That occurred on the 1st day of January, 1882, and from that time she was fed nothing but corn ensilage for a period of sixty-five days. The ensilage was the same as described in the last case, field corn. After several days' trial, sixty-four pounds was the quantity which it was found she would eat up clean daily. During the nine weeks the cow was on this diet her milk yield was thirteen pounds eight ounces per day average, and rapidly declining after the fifty-fifth day. For the next thirty days she was given the same ration of sixty-four pounds ensilage, and, in addition, daily, five pounds of grain, vix.: two pounds corn-meal, two pounds wheat-bran, and one pound cotton-seed meal. The milk yield of the cow averaged during this month seventeen pounds three ounces per day. Here was a daily gain of two quarts of milk, at a cost of seven cents for the grain. The month of April having arrived, it was desired to try a change to dry food before the pasturage season, so the ensilage was gradually replaced with dry forage. A ration of twelve pounds cut corn stalks and five pounds cut hay was substituted for the sixty-four pounds ensilage, with the same grain as in March. After the change had been fully made, the milk record was kept thirty days more, and the average yield was eighteen pounds; on the last day, eighteeen pounds four ounces. The ensilage ration cost seven cents, and the dry forage which replaced it a trifle over nine cents. The advance of the season may have had a slightly favorable effect upon the milk yield, but the cow was in a

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warm basement stable, where the weather could not have had much influence.

Upon being turned on to grass in May her product never reached nineteen pounds per day. During the four months' trial this cow had no exercise, and her drink, as well as the food, was weighed, and the amount consumed recorded. While fed on ensilage alone she seldom drank oftener than once in two days, and averaged for sixty-five days nineteen pounds of water daily (there were forty-six pounds more in her daily food). The water consumed increased to twenty-one pounds a day when the five pounds of dry grain were added, and to sixty-nine pounds a day after the entire change to dry food. The cow maintained a very even weight during the trial, ranging from 840 to 862 pounds. While receiving ensilage alone, an examination of the milk showed fourteen and a-half per cent cream volume, 3.85 per cent of fat, and 12.67 per cent total solids; this is above the standard for solids and below for fat. The milk had, when fresh, a strong odor, plainly resembling that of the ensilage when taken from the silo, and a decided alcoholic flavor. One person who tasted it when warm, not knowing its source, mistook it for a milk-punch, and said it was very good, but needed a little more sugar and had not quite liquor enough in it! This taste and smell was very slightly perceptible in the cream, disappeared entirely when the latter became acid, and nothing unpleasant or peculiar could be detected in the butter. On the contrary, the butter was much better in color and flavor than usual on dry winter diet, more resembling that from early spring pasturage; it required twenty-six pounds of this ensilage milk to make a pound of butter; this in February; when, in April, the cow had only dry food, the butter lost its color and pleasant spring flavor, although at that time one pound could be made from twenty-three pounds of milk.

In this trial, the best of ensilage was insufficient, used alone, to maintain the flow of a new milch-cow; grain was added at a profit, and a change to dry forage increased the milk yield, but at a cost of over five cents per quart for the milk gained. The same amount of milk on ensilage and grain, and on dry forage, showed a saving in favor of the former of fifty cents a month in the cost of feeding the cow.

III. A trial of corn-ensilage as the principal food of dairy cows, compared with the usual dry winter diet, mainly corn fodder.

Two sets of Jersey cows, eight animals in each, were selected from a milking herd, the greatest care being taken to match the animals, two

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and two, rather than collectively, as to breeding, age, weight, time of calving, period in calf, appetite and milking qualities. The daily record of all for more than a year previous was accessible. During the trial there was cause for dropping two of the animals from the test, and their mates were also removed, so that the final record is that of six pairs of cows. Every effort was thus made to remove the liability to error arising from individual peculiarities, a very important point in connection with any feeding experiment. These twelve cows were fed and treated alike for a fortnight prior to beginning the record, and then for twelve weeks their treatment was exactly the same, except that one set of six (lot A) received only corn ensilage, besides grain, while the other set (lot B) had dry forage only. The uniform grain ration was a mixture of four pounds of corn meal, four pounds wheat bran and one and one-half pounds cotton-seed meal, fed in two portions. Lot A received sixty pounds ensilage per day, it being of average quality as per analysis given hereafter, and lot B received twelve pounds of cut stover and five pounds cut meadow hay per head daily. The coarse forage in both cases was fed in two portions, one separate from the grain, while at the other time these were mixed. The following is the milk record of the two lots for the twelve weeks' trial:

SIX COWS. JERSEYS.	Milk per week at beginning of trial.		Milk per week at close of the trial.		Total weight of milk produced in 12 weeks.		Average milk product per week.		Average, 12 weeks, per day and per cow.	
	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.
Lot A, ensilage	825	2	731	12	9,295	9	774	10	18	7
Lot B, dry feed	816	6	723	14	9,375	5	781	8	18	10

The periodic loss or shrinkage of milk for every division of four weeks, comparing the quantity on the first and last days of these divisions, was as follows (gains marked + and losses —):

COWS.	January.		February.		March.		Total, 12 weeks.	
	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.
Lot A	—60	2	— 8	3	—25	0	93	5
Lot B	+ 1	0	—24	9	—70	6	93	15

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As to the quality of the milk from the two lots, these facts were ascertained, the figures being averages of the chemical and practical tests;

SIX COWS. JERSEYS.	Specific gravity of milk.	Total solids in 100 lbs. of milk.	Fat in 100 lbs. of milk.	Cream volume. Per cent of milk.	Milk required for 1 lb. of butter.
		lbs.	lbs.		lbs.
Lot A.....	1032	14.16	3.95	20½	22.9
Lot B.....	1029	13.81	3.93	18	20.2

The butter from the milk of the ensilage-fed cows was decidedly better, both in color and flavor, than that from the other lot.

In April the ensilage was discontinued and lot A put on entirely dry feed, the same as lot B. Then, after one week's intermission, the two were compared for four weeks more with this result:

Lot A, 687 lbs. 0 oz. milk per week, or 16 lbs. 6 oz. per day and cow.

Lot B, 702 lbs. 2 oz. milk per week, or 16 lbs 11 oz. per day and cow.

Tracing this trial all through, it is seen that the results in quantity of product are slightly in favor of the dry-fed cows. But this is offset by the better quality of the butter as well as the more thrifty and healthful appearance of the animals fed on ensilage. The differences are so small, however, as to come within the limit of error, and the trial may fairly be pronounced a drawn game.

These trials, with other comparisons, chemical and practical, tend to show that the nutritive value, digestibility, waste in feeding and result at the pail, are substantially alike in equal quantities of corn, whether cured as fodder or as ensilage. Tliese results, being verified, reduce the whole problem to one of convenience and economy in the method of curing, storing and feeding out the forage crops. With the exception of the labor of feeding, the advantages appear to be on the side of ensilage, when judiciously managed and under favorable conditions, enough so to recommend silos, if additional storage be needed, instead of more barns; but not the abandonment of good barns and the construction of silos in their place.

The chemistry of the silo is still much in the dark. It is not known why ensilage from different silos varies so much, nor just what the course of chemical change is which occurs in the process, nor the full effects upon the food value of the material. Opinions among those to whom people naturally look for the facts, range from the claim that

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the ensilage of any given plant is a better food than the same dried, or even in the growing state, to the assertion of considerable losses in nutritive value through fermentation. There is evident need of further investigation, carefully conducted.

The great variation in the chemical composition of corn ensilage is shown by the following results of numerous analyses:

PARTS IN ONE HUNDRED POUNDS.	Water	Protein.	Fat.	Nitrogen-free extract.	Crude fibre.	Ash.
Maximum	84.9	1.9	.9	13.4	7.9	1.4
Minimum	74.1	.9	.3	7	4.7	1
Average	81.4	1.3	.6	9.6	5.9	1.2

The degree and nature of the acidity developed and the means of controlling the same are points of especial interest and importance. That free acid exists in ensilage, usually in considerable quantity, is agreed. But is it acetic acid or lactic? This becomes a particularly interesting question when ensilage is used with dairy stock. It makes a vast difference whether a milk-producing animal is fed upon sour-kraut or pickles. Prof. S. W. Johnson, of the Connecticut Agricultural Experiment Station (report for 1881, p. 89), gives an average of 3.69 per cent of free acid in samples of ensilage analyzed by him, and classes it as acetic. This being the case, an animal eating 110 pounds of such ensilage (a ration advocated by some), consumes two quarts of the strongest vinegar acid in a day, and a milch cow fed fifty or sixty pounds of ensilage is given at least one quart. This is hardly an ideal diet for the purpose of producing "food for babes."

With such knowledge of silos and ensilage as is available in America up to the present time the reasonable conclusions upon the subject are as follows:

First. That one or more silos of moderate size are convenient and economical on almost any farm, to preserve green any forage crop which circumstances prevent curing, or some crop specially grown to supply succulent food in the winter.

Second. That such silos may be built with much less expense than has been generally supposed, and that upon their location and arrangement the economy of their use very largely depends.

Third. That this system of storing forage may be pursued almost regardless of weather, and usually may be arranged so that the chief labor comes at a time when other farm work is not particularly pressing.

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Fourth. That with proper care the process of ensiloing will preserve green forage substantially unimpaired as food, but with a probable increase in the per centage of protein and more or less loss in the carbhydrates.

Fifth. That as cattle food ensilage forms a good and cheap substitute for roots; but the crops generally used fail to fill the place of the root crop in a judicious farm rotation.

Sixth. That in feeding ensilage the best results follow a moderate ration rather than its entire substitution for dry coarse fodder.

Seventh. That the most marked result in ensilage feeding is the general condition and health of the animals, just as in the case of any succulent food.

Eighth. That the extensive use of ensilage upon any farm is mainly a question of convenience and economy dependent upon the local conditions.

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THE NEED OF A BETTER SEED SUPPLY.

By E. LEWIS STURTEVANT, M. D.,
Director of the New York State Agricultural Experiment Station.

Seeds are at the foundation of farming, and good seed of good farming. Since the modern discovery, entitled persistence of force, we are able to claim absolutely, and in accordance with science, what before might have been claimed from empirical observation and practical experience, that as we plant must we reap, that wheat seed yields wheat grain, maize seed maize grain, and that each seed produces yield absolutely of its kind. We may also claim with equal certainty, that all life, whether animal or vegetable, is subject to the law of heredity, a fact which may be recognized in various and varied disguises. Whether in the less known facts recorded under the terms alternation of generation, or retrogressive development, etc., or under the better known facts known as sports, hybrids, cross-breds, etc., in every case we find, when carefully studied, all to be but illustrations in apparent divergence of the generality of the final law of heredity, or that each life takes its direction from a preceding life according to law, and transmits the same life as modified by its own environment to its progeny.

In nature we find plants subjected to an environment which may be considered in some aspects as uniform — a constant struggle of the individual for supremacy; and hence those qualities which best fit for overcoming obstacles, or which are slightly favorable, give chances to the competitor for fulfilling the scheme of its life and for transmitting its advantages to a few of its progeny, which progeny in turn find destruction except for the few favored by circumstances and the inherited additional power. Where millions must necessarily perish in order that a few shall survive, the chances are that these few are more strongly developed in some direction useful to the perpetuation of the species than were those which succumbed. In the antagonisms of nature, produced by the struggle ever going on between the individuals seeking to occupy ground against innumerable competitors, opportunity and adaptiveness are the winning factors, and correlations between the uniformities of nature and the plant ultimately mould the

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plant into certain forms and proportions which enable intelligence to draw lines of demarcation which are defined by the words order, tribe, genera, species. In order to give an idea of this battle of plants, we shall state that the produce of seed from one square rod of garden soil, planted with "pusley," would, if planted out so that all should grow and flourish, supply, the next season, sufficient seed to furnish each square foot of earth on the globe with a plant. This startling deduction well illustrates the warrings which are a part of the scheme of nature, and which necessitate each plant to keep in rank with its fellows, sharing with its species the advantages already won. Lives directed by inflexible necessity have much in common; and, as in human lives, there is little opportunity, in the face of a constant struggle for existence, for the development of graces outside of what are useful; certain conditions necessitate selfishness.

In the cultivated plant all is different. The intelligence of man steps in to protect, and the plant relieved of the necessity of constant struggle, begins to develop abeyant characters, which, so far as they add to its usefulness to its new keeper, are encouraged and protected, and a new force, *i. e.*, man's action, forces the changes brought about by a changed environment to modify the direction of the action of hereditary forces, not only by the removal of forces previously antagonistic, but also by the additional means now known under the general name of selection. Hence, as natural selection (uniformity of environment reacting with infinite numbers and attempts, where the vast number must perish) is productive of species, so human selection (variability of environment with protection of individuals) provides varieties. Thus species and varieties have in common the characteristics produced by circumstances of a common environment, and differ in those characteristics which are furnished by a changeable environment.

Speaking comparatively, species are the production of a simple environment, varieties of a more complex environment, and while the law of heredity remains equally constant, yet its manifestations become different as environmental forces become changed. Selection, or protecting the individual not only against adversaries, but as against itself, by gradually curbing the influencing powers which tend to carry the plant towards warring life, and by strengthening the protective forces which are favorable to the peaceful life, is the grand weapon which intelligence uses not only to subjugate the plant to a domesticated condition, but to secure the strengthening of the hereditary forces which it is desired to make subservient to our use or fancy. It will

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hence be seen that in accordance with the stability and intelligence of our action, varieties can be made to take on in a measure the fixedness of species, or can be made even more variable. It must be remembered, however, that that protection which removes from the plant the necessity of acting for its own preservation, is correlated with a certain effeminacy, just as a warlike population during generations of slavery loses the vigorous assertion of free days; just as those for whom thought, food and amusement are provided, in time lose capacity for caring for themselves and for enduring the hardships of an exposed life.

The seed is the favorite agency by means of which nature secures the perpetration and distribution of a species. It is the concentrated plant, and carries within its coverings the heredity of the plant from which it has been derived. Our food seeds have become what they are through the agency of an environment controlled by men, and have become so changed as not to exist in their present form in a wild state. Wheat, rye, corn, oats, barley, etc., are not known in a natural state, but are a domesticated production, requiring domesticated conditions for their perpetuation under the form in which they now exist. The many minds of many men engaged in their production have produced many variations, and as heredity is a controlling force, productive alike for variation as for fixity, we have named varieties of all our cereals which differ in qualities even as between samples from various sources of supply, and yet each kind capable of being formed into permanency of habit. Our vegetable seeds, such as cabbages, cauliflowers, turnips, etc., etc., exist in their present varieties through the agency of man, and are as capable of being made into permanent varieties as they have been found capable of being made into such as they are. Their peculiarity is that their plant form has now ceased to be of protective advantage, and is dependent for fixity upon the action of man, who has domesticated their qualities for his own advantage, as against the advantage of the plant. Our fruit seeds also afford like illustration. A development of fruit for man's advantage as against the advantage of the plant, even to the extent of becoming seedless, and a quality such as the wild plant, having no use for this function, did not attain.

In view of these statements I think we may reasonably claim that our vegetable productions are artificial in their character; are dependent upon man for their perpetuation, and, although not as fixed in their characteristics as botanical species, are yet sufficiently permanent, in the presence of the ability to select, to retain the qualities that we

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have gained. Let us then recognize these facts and demand for our use permanency of character, and recognize that according to the source from which our seeds are derived may be their goodness of quality. One of the practical difficulties which we often have to meet is the impossibility of securing what we know we ought to strive after. Seedsmen do not guarantee their seeds, and the result is, the purchaser who pays for the best often obtains different seeds from what he stipulates for. If we are correct, that varieties of cultivated plants need not, necessarily, vary far from their type, that is, sufficiently far to escape identification, then it follows that the seeds purchased of seedmen should be guaranteed as true to name and the seller be held liable for failure. Should this be established by law or custom, then fixity of type would be sought for by seed purveyors, and a corresponding advance would take place in our dealings with nature, and great improvement would result along our whole line of vegetable growths, as seedmen would be compelled by the inexorable logic of trade to be men of ability as well as of probity, and mastering the best, there would always be a better beyond, toward which inclination and profit would point the effort for achievement.

Poor seeds are an annoyance and a loss, to which all who purchase seed are subjected. The whole system of our seed supply should be changed, as containing inherent faults. At present I know of no source from whence seeds can be secured true to name and true to quality. Competition amongst our seedsmen has forced the effort to buy cheap, and cheap seed must in general mean unreliable seed. When the demand of the public shall force the competition of seedsmen into seeking who shall offer the best for sale, instead of who shall offer the cheapest, a new day will dawn upon us; rays of promise will go out to encourage the farmer and gardener, and rills of increase combine from many a source to form the stream of agricultural product flowing toward a market, to return additional profits to the sender. Good seed in the hands of the good farmer is capable of turning a disastrous season into a successful one; of changing losses into profits; of bringing hope amidst discouragements. Good seed means vital seed; fixity of type; fecundity of product; adaptiveness to locality. The last the user must secure; the first three requirements it is among the duties of the distributor to furnish, and of the farmer to pay for.

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AN INDICTMENT OF SOME OF OUR FARM IMPLEMENTS.

A paper read at the Annual Meeting, January 17, 1883,
BY JAMES L. INGALSBE,
Of Washington County.

I recognize one great need of agriculturists — an implement for the initial cultivation of the soil. In plain terms, I am not satisfied with any form of plow as now made or used. Its operation is too slow — too wasteful of power, and too barren of results.

An acre a days means, in this latitude, only one stirring of the soil before putting in the seed. An acre of average sod land turned in the ordinary time and manner, as a mechanical result, is represented by one-seventh of one horse-power; the result of the operation is a very little of what we desire, and a great deal of what we do not want at all. With great hesitancy, standing here to advocate strange doctrines, I beg to say I have waited long, hoping to hear the truth from some abler person whose words might carry greater weight of influence, and that even after giving you a hint of my heresy, I scarcely dare to present my principal indictment of the plow.

In all these northern States the breed of horses now deemed applicable to road traffic and pleasure-driving are too light for effective service at the plow; most of the heavier breeds, as well as oxen, move too slowly to accomplish a satisfactory day's work in plowing. The quick moving team, when meeting a firm obstruction, bruise and discourage themselves and the plowman; damage or break the plow or tackle; and fail to do good work. The slow team, more satisfactory in some respects, consumes too much time in stops and starting, giving a better show of quality, but failing in quantity of work performed.

Upon every stone or rock fairly met the full power of the team, with the accumulated momentum, comes to either dull or break the *only* cutting edge of the plow, to replace which costs from one-half dollar upward, and of which, when one-twentieth part be worn away, the remainder is only valuable as scrap iron at the foundry.

Swivel plows have not been generally introduced upon level land, consequently dead furrows lessen the crop and are quite objectionable in the subsequent cultivation and harvest.

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By the swivel system, hillsides, fenced and plowed by themselves, in time become barren at the top, while a four foot wall at the foot has become a terrace.

Acknowledging the good wrought in time past by the plow, I ask for a different tool: a tool presenting not one, but several cutting points, cheaply replaced when worn or broken, a tool not specially made as an *anchor* for the team, but which, of its own action, will pass any ordinary obstruction without stoppage or break, working the soil to a reasonable depth, and *twelve* to *twenty* inches in width for each pair of horses, or their equivalent, employed, running upon wheels, with a seat for the driver, and leaving the pulverized soil directly in its rear.

With such an implement I should hope to see, even on our stony, stubborn soils, teams, of three or four, horses or oxen, driven by one man over two to five acres per day, rendering possible a better system of cultivation, consisting of at least *two* thorough workings of the soil exclusive of the surface working before committing the seed.

Why or for what purpose do we invert the soil? To bury weeds? Why bury them? To promote decay? Certainly not. In turning sod we create a miniature silo, and thus *arrest* decay. The elements and agencies of decay are at the surface. A fence post may be nearly severed at the surface, yet at six or eight inches below apparently as sound as when set. *To bury the seeds of weeds?* Mistaken policy. Let the germ of every foul weed vegetate at the earliest moment; watch it, tear it up when tender, leave it to the sun, the wind, the dew, to decay and thus furnish the best of food for a *better* plant.

Do we invert the soil to bury manure or fertilizing matter, expecting the young and growing crop to be benefited thereby? Then as a fitting supplement let us place a pen of sucking calves, a litter of choicest pigs and a coop of chickens on one side of a wall of plank, with their necessary and appropriate food upon the other side and leave the tender stock to shift as best it may, till grown sufficiently strong to open the way to dinner.

In the beautiful and harmonious economy of nature does not all fertilizing matter fall upon the surface? Does not the tender seed fall *accompanied*, *covered* and *protected* by leaves, feathery fronds and delicate vegetable fibre, which by their presence guard the plant in its infancy, retain the moisture and shield it from the scorching sun, by decay furnishing food for its growth?

We in our vaunted wisdom, when nature, by the processes of

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decay, the capillary action of roots, the boring and excretion of earth worms, frost and chemical action, has rendered a few inches of the surface rich in assimilable plant food, must needs to show our skill and workmanship, turn it smoothly under, and commit our seed to a freshly turned sub-soil containing perhaps plenty of mineral, but practically *no* vegetable matter for its support.

The tender wood plant sleeps safely through the winter beneath the snow, its roots scarcely touched of frost, by reason of the non-conducting power of air pervading its mossy fibrous covering.

The wheat or clover plant under the enlightened agricultural system of the latter decades of the nineteenth century, spends the winter clinging to the hard icy surface of a soil utterly at variance with its requirements, wind swept, alternately frozen and thawed, and in spring the farmer bewails the failure of a "catch."

I ask for an implement that shall pulverize the soil without inversion, leaving the finer vegetable soil with the stems, roots, leaves, etc., of grass and weeds in their proper places, at the surface, where they may best be dealt with to their destruction and decay, fulfilling the purpose intended, the protection of plants and the *retention of moisture.*

It is at least an open question whether we have not by the vast area of denuded, sun-baked, wind-dried earth annually turned up to the surface, materially assisted in bringing about some of the deplorable climatic extremes of common occurrence.

I ask also for an implement for *surface* cultivation at seeding time, which shall agitate, pulverize and toss up the surface soil, allowing the finer and lighter particles to occupy the surface, covered evenly and lightly with whatever of a fibrous nature may be present at the time, and *not*, after the manner of ordinary drag harrows as now constructed, when put to work in a field where a *proper* seed bed has been preserved, becoming a *two-horse swab* or *scrubbing brush*, scraping the vegetable covering and with it the seed, into rolls or winrows, leaving large areas correspondingly bare of both.

Our plows are only more elegant editions of their prototype, the crotched stick of the ancients; they *invert* more perfectly, but pulverize less. Our harrows, save perhaps the class of the rotating disks, with their mammoth congener the Chicago screw pulverizer, are essentially but the scraggy tree top or bush, drawn butt or top foremost, or sideways, as the case may be.

After quite a considerable study and deliberation, with the assistance of the best available means of information, I am fully of the

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opinion, and were I in some other place than the hall of the New York State Agricultural Society, I would say the best plows now offered to the farmers of our State are unworthy relics of barbarism, and the accompanying drag harrows are their miserable foster brothers. Members of the society, if, in your judgment, this be heresy, I can devise no remedy. If there be none who has ever thus thought, or who will now, perchance, in part agree with me, then I have spoken unadvisedly and before my time. Do I know what I am talking about, or have I handled the tool I have so maligned? Are you passing through some agricultural district, and do you see a lonely plow drawn diagonally out from the end of the last furrow, lying flat on the land side and beam, one whiffletree pointing at full length toward the distant barn, the other back between the handles? Rest assured the tracks around that plow are not the impressions of *my* boot. Do you see by the fence, on a distant steep hillside, a team in the act of turning, the plowman hauling the swivel plow by the handles, out of the furrow down the hill, and again up around the team, with the vim and clatter of a dog dragging a woodchuck from a stone-heap, the knot of the driving reins meanwhile about the driver's heels, the clevis unhooked from the beam, and a part, at least, of the traces from the whiffletrees, the horses alternating between nibbling grass and kicking each other — are you looking for me? You needn't go up there; that's somebody else. I have heard it said that lightning never strikes twice in a place. I know that a plow handle will.

Close upon forty years ago, when my hat at its normal altitude was not so far above a plow handle as it might be now, I remember finding abundant employment for two not very large or strong hands grasping the only handle of an old Wright plow, then in vogue in that section; they were, I think, usually furnished with only one handle, and certainly the special one of which I speak, with a long wooden beam and no wheel, could with *one handle* do a sight of kicking. The plow did the rooting and I turned the sod, taking as best I might the pounding, day after day, till, past endurance, I started for the old family physician. With looks of wondrous wisdom, he poked his thumbs around among my ribs, totally regardless of my contortions, till I thought it about an even chance between him and the plow, and felt vastly relieved when he gave his verdict, "One broken, another cracked, that's all." "Any help for it, Doctor?" "No, no remedy; go home and prop it out with plenty of Indian pudding and milk."

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On the hard, stony hillsides of my native county I wrestled at the plow tail for years, almost as an exclusive business through the agricultural season, and am not a novice with a genuine North Bend "Gulger," whose irons were freighted a couple of hundred miles by prairie schooner, to be wooded on the spot. Confessedly a dull scholar, I have had *abundant* tuition. This is an important subject, and one that may well engage our attention. Laying no claim to superior knowledge, I am only a patient investigator. Perhaps it is well that I say *here*, that twenty years ago I left my chosen profession, government surveying and engineering, and returned to eastern farming. It occurred to me that in agricultural implements there was a great field for systematic investigations; that while improvements in detail were almost without number, radical improvements were comparatively unknown. While in other industries the methods were revolutionized, in *this* all seemed to follow the rut, or at least with only slight changes. I deliberately set myself the task to know somewhat of agricultural implements. I have spoken to-night of one. Am I all wrong? It is a fact that whoever essays to go beyond the schools must walk alone, and that all reforms begin by failure. So too may I fail, but let me go upon the record as one who saw and indicated the greatest need of agriculturists at this day. If these things are so, why has it not been found out before?

Turning memory backward, I see on a frosty October morning, out back of the old homestead barn, a little boy carrying pumpkins from the adjoining cornfield, and, one at a time, throwing them over into the barnyard among the motley crowd assembled. This method of feeding was like my present estimate of the plow, not commensurate with the occasion; and, withal, the boy seemed in no hurry, though the morning chores were all done; it was fully breakfast time, and this feeding business was of his own ordering. Let us, if you please, go back a little. A cornfield lay next the yard; a rampant pumpkin vine had, during the summer, found its way through a hole almost at the top of a six-foot stone wall; then a yellow blossom, a green knob with a prodigious stem, and now a fair-sized yellow pumpkin hung suspended. The end of the vine below had been trodden to shreds; the cows at their daily milkings had rubbed against it.

Hanging directly over the pig trough, a dozen shoats had in frantic search of the last morsel of their daily food, time and again, snouted each other from end to end, almost in absolute contact, yet there it hung — *invisible*. The morning breeze, balmy with the odor of ripening corn, came in as the first glint of sunshine struck the field,

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and the brindled ox, driving the pigs from the trough, threw up his broad muzzle to the top of the wall, the brass knobs on his horns lying back on his shoulders, and as he filled his cavernous lungs with the scented air and again sent it in a cloud from his nostrils, almost like the exhaust of a locomotive, his fringed neck brushed the dew from what might have been his breakfast.

Clinging to the top rail of the fence and screaming with laughter the roguish boy had attracted the attention of other youngsters of the family who, in their hasty search for information, tripped against the supporting vine, not severing, but simply *disturbing* the vail of non-concealment. A game of foot ball ended the sport, but the memory of the farm yard incident has remained with the boy even to the present hour, and has caused him many times to interrogate himself thus: Gifted with intelligence and reasoning powers capable of endless development, why shall I be in many things as stupidly blind as those cattle?

I have said but little and the little has been poorly said. My only hope shall be that there may be some thinking of what I have not said.

In our researches after the unknown, with hound and horn we vex the distant hills, exploring far-off valleys, rewarded only by moss grown footprints, while radiant, glorious truth sits, tired with long waiting, at our door sills, seeking only admission.

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HOPS COMMERCIALLY CONSIDERED.

A Paper read before the Society, at Rochester, September 11, 1883,
BY EMMET WELLS.

Mr. President and Gentlemen of the Society.— On or about July twentieth last, I was honored with a communication from your Secretary, extending to me an invitation to address this Society upon the subject of Hops, stating therein "that it was proposed to devote one of the evenings of the State Fair to the subject of Hop-Growing — either a paper to be read or a lecture delivered, and to be followed by discussion." The Secretary trusting that my long and continuous connection with this interest would be a sufficient apology for asking me whether I would consent to address the Society upon the occasion, in which he wished me to "treat the subject in such a way, and deal with such portions and aspects of it as, in my judgment, might be most likely to be useful." I responded, stating that my publishing duties and other business engagements at home were such as would preclude the possibility of my attendance; but that if the Society were willing to accept from me a written address or essay on Hops, to be read at the meeting, I would most cheerfully submit the same. This proposition having been accepted, I have thrown together certain points as to my experiences and what I know about hops, and in so doing have deviated from the usual rule of details, which most likely are known to every person engaged in their cultivation, etc., as I am fully aware that theories cannot well be placed in juxtaposition with actual practical knowledge. Neither have I given my lucubrations to statistics, nor to poles, yards and other matters which the growers have been gorged with to an endless nausea; but what I have prepared may be of greater service for the future to those who are so deeply interested in cultivating an article, which, at times, assumes the characteristics of the rainbow, or the dissolving view.

Every gentleman present who has had anything to do with the material in question will most probably acquiesce when I say it is a very slippery, treacherous and difficult one to manage, and one with which the hopes of reward for expense and anxiety may be blasted in a night from causes which are beyond the control of man.

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My position as a publisher of a weekly hop market report for twenty years past has been one of the best schools imaginable for studying and learning human nature, and my experience has been that a more cranky set of men to deal with could not possibly be found in any branch of trade or industry than hop men (the present company, of course, excepted), especially when essaying to please them on hop reports. A grower who has his hops on hand, and who has, perhaps, lost or pretermitted a favorable opportunity to sell, is invariably on the watch for "bullish" reports and inflated quotations, while on the other hand the brewer, who is short of stock, is anxious to see "bear" reports and low prices. All this is as natural as it is for a duck to swim.

As the market always assumes one or the other of the above mentioned phases, which one cannot under any circumstances control, the difficulty one experiences in trying to report it is just terrible. To please both sides is impossible. My universal and uniform rule has been to furnish, weekly, the *actual* and not the fictitious state of the market.

Gentlemen, the hop season of 1882 and 1883 is one which will long be remembered by the oldest inhabitants, even to the great-grandfathers, as being replete and fraught with important events, the most prominent of which was the great and extraordinary fluctuation in the prices of hops from the middle of May, 1882, down to the close of the season, August 31, 1883.

The uniform price for choice State hops in New York city, for the seven weeks following March 24, 1882, was twenty-five cents per pound. On May twelfth, following, I quoted twenty-six cents as the highest price. As the season advanced the following rise took place, viz.:

May	19	$0 27	September	1	$0 55
May	26	28	September	15	57
June	2	30	September	22	62
June	9	32	September	29	65
June	16	35	October	6	67
July	7	36	October	13	70
July	14	37	October	27	85
July	21	45	November	3	1 05
July	28	48	November	10	1 10
August	11	50			

At which figure it remained up to November twenty-fourth, when values commenced to decline; the price receding about five cents a

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pound each week down to January 5, 1883, when there was a rally and the price again ran up to one dollar per pound. Here it remained without change for three weeks, when another serious decline commenced and continued down to August third, at which time the bottom was at least reached, twenty-eight cents per pound being then the ruling figure. From that date the price advanced to thirty-three cents, and so remained down to August 31, 1883, the close of the season.

The true cause of the very high prices which ruled last fall can be laid at the door of the speculator, *not* to the failure of the English crop, as many supposed and still believe. There was no better reason for hops going above sixty cents a pound than there was for potatoes going to fifty dollars a barrel. Both the hop and potato crops have proved sufficient for the world's demand for the year; and why, it may be asked, should the one advance in price and not the other?

A greater calamity could not possibly have happened to the American hop grower than to have hops forced up to a dollar or more per pound. We speak, of course, in a general way; for, while a few profited by it, a very large majority of growers lost or will lose by it in the end. And why? Because thousands of farmers have increased their hop acreage, while thousands of others who never grew a hop before in their lives, have come into the business; not alone in this country, but also in England, Germany, Belgium and France. American growers who think that farmers on the other side of the "big pond" have been asleep and oblivious to the "situation," will themselves awake from the delusion one fine day, and discover, when too late, their egregious mistake.

Over-production in any article means, as everybody knows, *ruinous prices.* It is the same with hops as with all the products of the earth — with manufactures — even to the breeding of quadrupeds and other animals.

It will not probably be felt to a very great extent the present coming season, as it is likely there will be a steady demand, which must of necessity prevail, consequent on the bare and exhausted markets and low stocks of brewers.

Apart from this, we may not have grown so large a crop this year as we expected, owing to a hundred days' drought on the Pacific slope, and to the new yards set out here in the East last spring not coming into bearing until next season. But, with a favorable season all round, it will be the '84 and '85 crop that may possibly swamp us, and which we shall have to stand from under.

I do not desire it to be understood that I advise, or even suggest to

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any grower who has struck out to make his "eternal" fortune in hop culture, to lose courage, or even to become disheartened, and plow up his yard because he gets no return for his labor and outlay for the first year. Once you are in the business in a moderate way, *stick to it*, and strive by good cultivation to excel and surpass your neighbor in quality — not one, but all who are engaged in hop growing. Good and well cured hops always command the top price in all markets.

The next point which hop growers have to meet, and that at the very opening of the present season, is the tare on hops and marking them. A new rule adopted by the Commercial Exchanges throughout the country requires every hop grower to brand his hop bales with either his full name or initials, year of growth, and county or district where grown. This will be of immeasurable advantage to those growers who produce a superior article, for their respective names will soon become familiar among brewers, who are always on the look-out for *choice* hops, and a market is assured to such growers promptly at the highest price.

The question of demanding and allowing a tare of seven pounds per bale, to take effect on the crop just harvested, is another outcome of last season's high prices. The equity or fairness of the demand is a question which I prefer not to discuss at length in this address. It is purely a local matter and must, in my opinion, be settled by the parties most directly in interest. The matter has evidently stirred up feeling, but my opinion is it will be arranged satisfactorily to both producer and purchaser at a now very early day.

The next point, which appears to me an important one, was the "boom" of the last season, and I have, to the best of my ability, discussed it with all the impartiality I could master, and given, as I believe, the facts, while I have not omitted to say something about "substitutes" which the brewers in this country have been openly accused of using, and of thereby not only deteriorating their lager, now so universally used, but also decreasing the demand for hops.

Among those present, as well as among those who may hereafter read my remarks, perchance there are very few who have analyzed the cause wherefore, or can furnish the reason why, the price of hops during the "booms" of last season, instead of increasing and carrying the figures up to the wished-for price, say two dollars per pound, commenced declining after reaching one dollar and ten cents, which was the highest price quoted in the New York market, although it

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was reported in three instances that a higher figure had been paid by speculators in the interior.

To the larger portion of the hop growers, who either, under the advice of friends (?) or following their own volition, held their crop for the *good time*, which never came; the bold or reckless speculator who was tempted to venture his margins on hops when they had reached the fabulous quotations alluded to, and the parties who counseled together, "*not to sell their conjoint holdings of several thousands of bales, unless the price fixed by them was obtained*," it may at this time, when the article has reached its almost normal value, and but little above the figure it started from (twenty-five cents) when the rise commenced, it may indeed appear an anomalous phenomenon that hops did *not* go to two dollars per pound.

There were numerous men — growers, speculators and dealers — who were ready and willing to bet their "bottom dollar," with lunch and drinks thrown in, that the price just quoted *would* and *must* be paid before the first of June last. Their predicate was, "there are not as many hops in the whole world for sale as are required by the brewers to complete the season's brewing." Others, understanding still less the causes which produced the calamitous effect to many, took for their hypothesis the idea, and publicly proclaimed it, that "while the brewers managed to get along during the cold weather with but few hops, when *hot* weather set in they would be compelled to come into market and buy; and, therefore, hops would enhance in price, and a real good time would come for holders and speculators."

Sophistries, and vague theories were indulged in by dealers, who having but little else to do, as trade was dull and stagnated, pondered on the situation and made their respective wishes "father to the thought."

The hot weather came, beer flowed abundantly over the retailers' counters and at all places of pleasure resort, Coney Island included, but the boom came not, and at this time is beyond the power of galvanism or Farradic electricity to resuscitate. Many of the parties referred to were and are subscribers to the WELLS' HOP CIRCULAR, but would not, or did not, pin their faith on what was therein printed. On the contrary, anathemas, dire and deep, were hurled at the editor, accusing him of being in the interests of the brewers.

Editors of newspapers in the hop centres dashed off occasionally pasquinades and diatribes, as well as ill-natured remarks on the proprietor of the CIRCULAR, thinking, probably, that he could be

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intimidated and thereafter would quote what was neither the condition of the market nor the truth.

Had the holders of and speculators in hops been possessed of a grain of faith in him, many, who possibly are now mourning their losses, would have been considerably richer than they at present are, as not only was enough written in the Circular to forewarn everyone interested in hops, but the approximate quantity on hand was stated as well as the number of bales which would probably be on hand when the season for the new crop arrived.

Time has proved how correct all these figures and statements were; and now that the smoke has cleared off, and referring to the files containing the predictions and facts, it is gratifying to see how correct I was.

One factor which operated to keep the price of hops from advancing or holding up to that to which they "boomed," was the knowledge and experience which the brewers in Great Britain had acquired since the abrogation of the excise inquisition that had existed there under legal enactment, designed to insure pure and unadulterated beer and and other malt liquors for the people of that country.

John Bull, wherever found, is a beer drinker, and loves his pot of porter, or his draught of "bitter beah" above all other potables. But, as the "old law" existing before 1842 was then abrogated by Sir Robert Peel, the tendency probably became general among British brewers to return to the system prevalent years anterior to the act of the English parliament, interdicting under severe penalties, the use of any material, drug or extraneous preparation, which could in any manner affect, seriously or otherwise, the general health of those who indulged in malt liquors. No sooner, however, did the bill introduced by Sir Robert Peel, in 1842, pass, striking off the interdictory duty on quassia wood and other drugs, which it had been proven had been in years long gone by extensively used in British breweries, than the importation of that special "*bitter*" into England became immense.

A further and later change took place in the excise duty, and that on hops was taken off, leaving the brewers to pay their beer tax on the quantity of barrels they respectively delivered, thus freeing them from the excise men, and leaving them at liberty to mix with their brewings, if so disposed, what are now known as *substitutes.*

It therefore may be apparent, if the several factors were at work, that the British brewers, with the knowledge previously acquired by their predecessors in years before, viz.: that various materials had been used, which gave their ales and beer a flavor equal to that pro-

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duced by hops, and which could be purchased at a very much cheaper rate, used them very extensively.

Hence this factor alone, combined with the possible other, that substitutes were used in England at a much cheaper rate than hops could be procured at, aided materially to prevent the "boom" affecting the English market, to which our dealers were hopefully and anxiously looking.

Nature produces the drugs from which the alleged substitutes are made. Advanced chemistry assists in manufacturing such drugs so as to closely imitate the flavor of the hop, while certain compounds which scientific manipulations prepare, keep down acetous fermentation.

Hops then did not become so great a necessity as was expected and anticipated, in the face of the knowledge that a short crop existed in England. On the contrary, thousands of bales exported from this country, as also from Germany, to England were returned to the points whence they had been exported. The English brewer did not want them, and as late as the twenty-ninth ultimo, brewers there were in no hurry to lay in stock, even at the then reduced rates, thinking that they would and must go lower.

What are hop growers in the United States to deduce from the facts I give? Can they not see, that although "there were not hops enough to go round," "although the hop crop of 1882 was known to be short," and "a hop famine inevitable," although "hops must go to two dollars a pound;" that England, or rather Great Britain, which brews from forty to fifty million barrels of malt liquors per annum, managed under scientific manipulations to do so with less hops than our speculators and growers calculated on, and did not, and would not, swallow the hook bated with high and inflated prices, but jogged along in the even tenor of her way, and made the "hale" maugre the fact the "'ops" were not in full supply.

The alleged substitutes, if used, possibly answered all purposes.

The remarks offered as to the British beers and ales do not, I believe, apply to those of our German cousins. They live, breathe and exist under a very different atmosphere, and have laws rigid enough to prevent the slightest adulteration of food and drink.

The malt liquors made in every part of Germany at this very moment are more genuine than those manufactured in any other country, our own not excepted.

From the time of "GAMBRINUS," if ever such a being existed among brewers, of Hennig or of Heinrich, who lived in 1400, down

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to the days of Dreher and Seldmayer, Germany has been famed for her lager and other beers, mild as well as strong. It is the national drink for man, woman and child. It must be apparent to all persons that nothing but rigid and effective laws can keep this manufacture from adulteration.

By the laws of the German Empire, which are very stringent, and where the excise man or the "gauger" is not easily blinded by a rouleau of "*thalers*," or a bundle of King William's "shin-plaster" money, the brewer is compelled, under the watchful argus eye, to manufacture none other than genuine lager, and its many cognate beverages. Were he weak or stupid enough to permit the hope of gain, of a little extra profit, to lure him to make his brewings from aught else than what the law demands, regulates and prescribes, not only would severe punishment and imprisonment follow, but also absolute and certain confiscation of his property would be the result. A case which lately occurred illustrates the efficacy and efficiency of German law and its administration, and shows how rigid are its working and its precautions against adulterations.

A person engaged in the wine trade, fully cognizant of the risks and penalties attendant on nefarious operations where articles which enter into the sustenance of the inner man are concerned, undertook to manufacture a large quantity of wine, wherein, upon analysis, it was clearly proven but very little of the grape juice was used, and was discovered in his mal-practice. Criminal proceedings were instituted against him, when, upon his trial, he pleaded that the wine he had made was not intended for home consumption, but was designed for exportation, and especially for sale in the United States, and, to strengthen his plea, several cases of the wine, fully addressed to this country, were produced in court. This species of sophistry had but little weight with the court, which condemned him to penal servitude for several years, and confiscated all the spurious wine which he had manufactured (under his advanced chemistry [?], boxed and ready for boxing, as well as his whole establishment. Other instances could be given, but this one may suffice.

Would it not be well for all the world, who indulge in malt liquors, if the same stringent rule prevailed everywhere, and more especially where the alleged substitutes are used? The hop growers at least would certainly be benefited.

Having touched on brewing in Great Britain and Germany, I come to the discussion of the possible causes which operated, during the past twelve months, to prevent the price for hops from advancing

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in the face of a "*short crop*," or prevented a "hop famine," and as a natural sequence, hops attaining to the wished-for price of two dollars or more per pound.

The brewers of the United States, who by the way are an intellectual and intelligent body of men, men who have for years past kept abreast of the times and availed themselves of every improvement in machinery and advanced chemistry to facilitate not only the manufacture of lager, but also to aid them in making larger quantities per annum as well as to prevent the "worts" souring, seeing that the populace at large preferred the beverage to whiskey or other alcoholic drinks, which every economist knows to be detrimental not only to the public health but also to public morals, weal and quietness, know as adepts that the English brewers may have resorted to other articles than hops to assist in the manufacture of their malt liquors. They, as reading and well educated men, know that it was not until the year 1524, in the reign of King Henry the eighth, that the culture of hops was ever attempted in England, and that they had then been only recently in use elsewhere. As to what the old-time monks centuries before used, and from them the art of beer making is doubtlessly derived, history furnishes, I believe, no account. They certainly used barley for the body and alcoholic strength, and possibly knew of some of the drugs which will be hereafter spoken of as giving the taste and flavor desired. Nature furnished them then; she does so still. The brewers of yore did not use hops, and yet, if the old legends and songs of joy can be relied on, beer was the delight of thousands.

Although I am not in the secrets of the manipulation which the "worts" and "beer making" undergo, it is not hazarding too much to say that the drugs which I will name have been used, both in Great Britain and the United States, during the last year, and, with the aid of chemicals which keep down the acid reaction, lager has been made on a very extensive scale and with a very small proportion of hops to the barrel.

If the predicate stated were otherwise, and the usual stated quantity had been used, there probably was not enough produced in all hop-growing countries for the number of barrels of malt liquors of all denominations manufactured throughout the world in 1882–83.

Assuming it for a fact that there was made in the United States in that period, 17,500,000 barrels of malt liquor (and it is estimated that 17,750,886 barrels were brewed), and that each barrel required, as formerly, one and one-half pounds of hops, it will have demanded of the brewers to use 25,750,000 pounds of the article, which, reduced to

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bales of 180 pounds each, would reach the enormous quantity of 143,055 bales.

The brewers, no doubt, held a certain amount in stock, accumulated from previous years; yet I am not stretching the imagination too far in saying that with the entire product of the United States for 1882–83, viz., 130,000 bales, and the unsold stock in hand at the opening of the crop on the first of September of last year, combined with the few thousands of bales imported from Germany during the year, less what we exported, that there were not sufficient hops in the United States to make the number of barrels estimated, or that was actually brewed, especially as there were 20,000 bales left over on September first of the present year, including what the brewers held.

When we also take into consideration the immense brewing of malt liquors in Great Britain, both for home consumption and for export to all parts of the world, which, by the way, is simply enormous, requiring not less than 400,000 bales annually; while the price of hops (instead of being enhanced in the face of a short crop, and the exhaustion of old stocks) gradually decreased until they are now at almost normal figures, it can easily be imagined that the British brewers possibly resorted to articles which subserved their purposes equally as well as hops.

Some present may, and doubtless will, argue that hops are indispensable, and that unless used in full quantity the ale and other malt liquors will not keep. The fact of the importations of ales standing well, both in bulk and bottle, furnishes an irrefutable argument against any such theory, especially as nothing is so trying to vinous or malt liquors as a sea voyage.

No better judges of ale, beer, porter or other malt liquors can be found than in "Old England," and yet no tidings have reached us that the populace there have murmured at the "black porter" or "bitter beah." There are six glasses of the "barley-brew" probably drunk there to one in the United States.

If substitutes were used, no evidence has as yet been published that the public health there has been injured. At least not visibly.

Our brewers are wide-awake men. They know, and know well, that if the British brewers resorted to innocuous drugs, and met no opposition from "John Bull," who so dearly loves his porter, ale and beer, that the American (for all are Americans who enjoy the beneficent protection of our flag and eagle) would not raise his voice so long as the "schooner" was doled out to him at the insignificant figure of five cents. Had our brewers raised the price of a barrel of lager beer

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to a rate that would have forced the retailer to charge six or more cents per glass, a beer rebellion might have ensued more terrible in its effects than the whiskey war in Pennsylvania, or the Dorr rebellion in Rhode Island in years gone by. So long as the price was kept to its previous standard, the flavor of the lager retained and the pocket not touched, so long were the beer drinkers perfectly satisfied and swallowed their potations in silence, never giving themselves the trouble to inquire whether substitutes were or were not used. The large majority of our brewers emphatically declare, and challenge proof to the contrary, "*that they use no substitutes whatever;*" but have merely, when hops were extravagantly high, reduced the quantity to the very lowest minimum. Some, since hops have fallen, have increased the quantity to each brewing.

It is safe to say that the brewers did not consume more than 75,000 bales of hops in the season of 1882–3; and this, conjoined with the sparse demand in Great Britain, accounts for the fact that the "boom" came not, and in the face of all that was written at the time, it should never have been looked for.

It is futile for any one body of men to array themselves against another; to raise a hue and cry against the brewers, and promulgate the idea that they use noxious or deleterious drugs in the manufacture of lager. They are as wise as serpents, and would not, and will not, pull down the structure on which the return for their large investments depends.

The problem now to be solved is: If our brewers (governed by law) have discovered that with the use of a little over half a pound of hops to the barrel, say six-tenths of a pound, they can brew lager which suits the beer drinkers, their patrons, will they not continue to do so in all the future and thereby reduce the demand? Hop growers should, we think, maturely consider this point.

The next and important question is, whether the hop grower and brewer could not, at an early day, meet in convention and by wise counsels back up the law of the land and the rules adopted by the Treasury Department at Washington requiring a statement of all the materials used in beer making.

The leading brewers of New York city, according to the New York *Daily World*, are all strongly in favor of the rule as published in that paper. One said: "The new law is a boon to all honest brewers, and it is to be hoped it will be rigidly enforced; and I am sure that no large brewer will be afraid to make out his monthly report. There are many small brewers who have no facilities for making good

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beer, and yet they make an article which they sell for about one dollar a barrel less than we can afford to. If the reports are properly examined, and regular inspections made, these parties will soon drop from the market, or else the brewers will find comfortable quarters in State prison for perjury. Let me explain to you what kind of a beer I have reference to. Not long ago a country purchaser came to me and talked of purchasing a large quantity of beer. He sampled ours, and finally gave us a large order. By the way of reference I said to him, you have not asked me the price of my beer. Then he exclaimed, 'why, I can get beer for eight dollars per barrel, and you charge nine dollars.' That settled it. And that same customer bought his stock of a small brewer who makes about 10,000 barrels a year; whereas we brew from 80,000 to 100,000. I was astonished when he showed me the bill, and resolved to find out how his beer would keep. About a month after he returned and asked me to look at a sample of his recent purchase, saying there was something wrong with it. When I examined it I found that it was sour in taste; a keg-drawer would pass it by with a look of contempt. Good beer requires hops and malt, and this has no hops, which is the most expensive article we use, and which is that which gives beer that good bead and sparkling body. The longer you keep beer the better it becomes. An article like the one I speak of ought to be prohibited, and the quicker it is done the better for us."

The hop growers and brewers should go further than the present treasury regulation requires. They, jointly, through their Representatives and Senators in Congress, might demand that the adulteration act should be so amended as to require each brewery to be under the constant surveillance and inspection of a government officer, whose duty it should be to keep a daily record of *each and every article* received into and used by the brewery; and the amended law should specifically and unequivocally state how many bushels of malt, and ounces or pounds of hops *must* be used for every barrel of lager, ale or porter brewed. A precedent exists in the regulations for the making of whiskey. By this process no opportunity will be afforded to any brewer to use, as many believe they do, "Gentian root," "Columbo root," "Chamomile flowers," "Quassia wood," or extract, "Nux Vomica," "Aloes," "Cocculus Indicus," "Licorice paste" and the many other articles which it has been alleged have been employed by brewers for years past, and more especially during the last twelve months. The custom reports for the port of New York show an enormous importation of aloes, chamomile flowers, gentian root, Columbo

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root and licorice paste, and by a singular coincidence but very little of these articles found its way into the bonded warehouse. Very nearly all entered into immediate consumption.

It is apparent that hops are not an article of general use. The brewers are the consumers of nearly all that are grown. Hence it follows that the interests of the grower and brewer are intimately connected and associated, and since the latter possesses just as much human nature as the former, a feeling of comity, beneficial in the end to both, should be cultivated; then both will be benefited.

In this country, where so much land can be planted with hops, and in some sections yielding as they do quick and large returns, taking one year with another, there will always be a sufficiency for all the brewers in our country, the price keeping within moderate limits, to use the hops as heretofore, or in years gone by, and probably to permit of some being exported. Yet we must not lose sight of the fact that Australia is entering into competition, and can produce the article on a pretty large scale, and that while Australian hops may not at present be equal to ours in quality, time may remedy the evil, just as at the present day we ourselves are producing a far better article than formerly.

Our growers throughout every hop section should, therefore, put forth every effort to cultivate properly and carefully; should manure without stint, exercise due and proper precautions in curing, bale their hops honestly, and, if possible, avoid over-production.

I had intended to have discussed adulterations in general as germane to the subject, and now so alarmingly prevalent, and positively injurious, not only in food in all its branches, but also in nearly everything which enters into daily household consumption; but I have extended my subject to a limit little anticipated when I accepted the honor conferred on me, and therefore dismount from my tripod, tendering to all who have listened, or who may be engaged in hop culture, the assurance that if but one solitary idea be of benefit to even a single individual, I shall be amply repaid for this, my first effort, in giving to the world a few thoughts, which if not novel are at least honest.

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THE WINTER FEEDING OF CATTLE AND SHEEP.

A paper read before the New York State Agricultural Society, at Rochester September 12, 1888,

BY WILLIAM BROWN,

Professor of Agriculture in the Ontario Agricultural College, Guelph, Ont.

I think there is no subject so interesting to the most of farmers in these times as how best to produce beef and mutton *in association with crops*. Of course, the first place must be given to natural pastures, under favorable conditions, as the great and cheap source of flesh; with this we have nothing to do at present, interesting and speculative as it undoubtedly is. We will not even say much about grazing in connection with our ordinary farming, but confine time to some thoughts on feeding and fattening cattle and sheep in winter, as applicable to the average farmer of *this part of the continent.*

Most men have, as a whole, sound enough views on this branch of the profession, but as they are not in the habit of analyzing in such a way as to place things on distinct ground, some erroneous views prevail. I wish then to submit to this prominent Agricultural Society a few phases of the subject that are seldom discussed in public, and not often elsewhere.

And first of all I make the assertion that to grow the cheapest and greatest amount of crops we must grow flesh. I am a believer, with a few others, that the average soil of *this country* will give the average produce by such a system of rotation and thorough cultivation, *without manure*, as, in each individual case has, by district, farm or field, and long practical experience, been found most suitable. I apprehend no one will deny the past systematic — not unsystematic by any means — grain growing of the American continent—wheat succeeding wheat and corn corn, year after year, and how now we have so little difficulty in getting up what is called fertility, or a condition fit to grow any crop. Gentlemen, I take the position that our lands have not been exhausted by such management, but simply impoverished of certain plant food, and that they only need, as we find by experience, change of crops and thorough cultivation to bring about superior results. I cannot tell you exactly why it is that the American soil is so active in repair-

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ing life in comparison with Europe, and possibly nobody else can, but like the expounder of any difficult problem, I have my own ideas, and fall back upon the wonderfully indefinite, varied, irregular and somewhat mysterious field called *climate*. Why is it that all animal life whatsoever is so free of disease here? — climate; why is the man of this land himself so active and clear-headed? — climate; and so also in regard to farm crops, there is clearly a recuperative power in our climate that not only rapidly re-invigorates soil, but is always ready to support most forms of vegetation. We have abundant evidence of this from our experimental stations and some of the leading farmers, where, again and again, it has been found that some special fertilizers are practically valueless — that under certain seasons especially they have no effect in increasing the fertility of the soil. Our northern climate is undoubtedly the inexhaustible source of very much farm produce.

But farming without manure, as we could well do, is slow and expensive — there is nothing so expensive in our profession as *cultivation;* that is, the use of the plough and other implements, and hence the practice of making manure at home, which greatly lessens the necessity of cultivation, and at the same time adds directly to fertility. I fear I am right in saying that very few of us place a proper value upon the *cultivating* power of farm-yard manure — what is called its physical property — separating, compacting, draining, warming, and so on — invariably more than one-half of the whole value of the material.

I know of no want in the farm practice of this country, outside of first-class farm-yard manure, systematic cropping, and general good management — the great regulator being climate.

My second assertion, therefore, is an echo of the first — that we must grow flesh. If there were any other means by which we could manufacture our crops into manure it might be advisable of adoption, because flesh is but the secondary object in this work. Allow me to impress how this fact comes: In growing crops we make an immediate and clear profit by their sale, if we choose, but no form of beef or mutton *ever does so.* You cannot possibly show that it pays of itself, at once, to grow beef or mutton under our winter conditions, nor indeed can it be done anywhere, except on pasture all through. In explaining this it is necessary to premise that beef cattle life is made up of three periods, (1) the milk period, (2) the framing period, and (3) the finishing period. Now it may seem a remarkable thing to many that the only time in these periods when the animal would give

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a cash profit is during the first, or milking, and the sooner it is disposed of, even then, the greater the profit; indeed, take the case of a good grade bull calf newly dropped, with a demand by some one who has spare milk and wishes to raise steers more as a system than you do; if you are offered ten dollars, or even seven dollars, jump at it; you will never handle such a balance again on that animal. But you ask how can this be when I have myself plenty milk and other food? Just because this same animal has two great duties to perform: primarily to manufacture manure, secondarily to make flesh for food, and if we look only at the latter, which has a limit, without the former, which practically never ends, then we are great losers indeed.

But again, I find beef life has also three great financial positions, and that they are of equal values; first, its value as a *store* previous to entry for finishing; second, the cost of finishing the beef, and third, the value of the manure obtained during its life. Each of these, on an average of conditions, is equal to thirty-three dollars. A store steer, on the first of October, when eighteen months old, should weigh at least 850 pounds, and be worth about four cents—thirty-three dollars. When fed during winter, as it ought to be, to reach 1,300 pounds by the end of April, when fully two years old, the actual cost to the farmer to produce the food is as nearly as possible thirty-three dollars; and then the value of the manure, got for two winters, is, according to all sound views, not less than thirty-three dollars. You will take my word, meantime, for these abstract figures, as time may not allow of details.

Still further, there are, in our conditions, other aspects of a particularly interesting character affecting this seemingly simple piece of beef and mutton, and to know which is a national as well as a personal duty.

We have placed the store of 850 pounds at four cents, and the finished animal of 1,300 pounds is usually worth six cents. Here is an increase of 450 pounds to the live weight, which, observe, not only adds twenty-seven dollars (450x6) to the value, but has actually *raised all the* 850 *pounds two cents each in value*, or, to put it another way, every pound added by the finishing process increased the *quality* and value of two and one-eighth pounds of the original store *thirty-three per cent.* This is not the case in Britain, where usually store cattle fetch as much per pound as the fattened one, and consequently we have a position as feeders of live stock very much to our advantage in the world's market. Why, we could even make

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handsome profits by shipping store cattle to Europe; but with this we do not meddle to-night.

And yet again, ere treating of the actual fattening of animals in winter, it is desirable to present another important fact, not often looked at properly. It is this: In feeding or fattening live stock, the farmer usually confines himself to his own productions, for practically he does grow all that is needed for the best results, and while he knows how much is required per head per winter, he rarely estimates the cost of producing either beef or mutton. Few of us, at least, ever think of placing a value on straw, on our own labor, on milk given to calves, or on the service of our own bull, and yet, of course, they are worth something, for they have cost us something. But the point in this case is, *how much* to charge for each. When the ordinary farmer sells corn at fifty cents per bushel and hay at ten dollars per ton, on the market, he does so at a profit, so far as he knows; but whether he is realizing an actual cash profit he is not sure, and possibly could not prove. In feeding his cattle and sheep with these, however, what should he do? Should he charge these market prices? If he does, why then clearly he is making the same profit as he would on the market. This position is unassailable, and hence we see how important it is to understand just what we are doing. So, then, we have no right to steal this first profit from the fattening animal and expect, *necessarily*, another profit in selling it to the butcher or exporter. Well, if we do receive the second — well, if we don't, perhaps. Many experiments at our station have established that, under average conditions, it costs fully twelve cents for every pound added to the weight of a good store cattle beast during the finishing term; and by no kind of management can anyone, with six months summer and six months winter, reduce the cost below ten cents, when heavy weights and early returns are desired.

But there is yet another aspect of this subject that is of serious importance to the grower of store cattle and sheep. Take cattle for example: We are in the practice of regulating the price of stores by the market — not by what we know, if we do know, they have cost the farmer to produce them. It is not a difficult calculation, however, to make this out through all the items of sire's service, milk, ordinary and extra food, with attendance and risks, up to thirty months old, and, at the same time, allow, as we have already seen, for manure value obtained. The cash cost to the farmer will make up to four cents per pound of the live weight of the store animal, when ready in October to take on the "last dip" of the succeeding six months of winter.

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So therefore in selling, say on 850 pounds steer at four cents, the producer gets only what it cost him in cash — apparently he neither gains nor loses by the transaction, but actually he is a considerable loser, because in this figure *no market value* of food is charged, and no interest is allowed for outlay, during the thirty months — unless, by the way, the particular individual farmer is a believer in fattening animals for *the sake of the manure alone.* Obviously, though, any well balanced store cattle beast in the neighborhood of 800 pounds, cannot be sold under four cents, and the purchaser at this figure has the best of the bargain.

Let us take another glance at the manure question, for it is a big one in this study, and it will be well to instance an extreme case in the experience of the Ontario Experimental Farm, so as to make a safe place for the average example: In January last, I bought a steer for $160 that was one year and eight months old, and weighed 1,530 pounds. My object was to prosecute the study of early maturity, irrespective of cost. Yesterday this animal weighed exactly 2,005 pounds, when, of course, he was two years and four months old. To date, have I lost or gained? To the purchase-price must be added seven dollars and fifty cents, being interest on outlay for nine months, and the market price of the food — corn, peas, oats, hay, roots, green fodder, oil cake, molasses, Thorley's condiment and attendance, amounting to $108 — showing in all a debit of $275. I can get $240 for this animal, to-day, from those who compete at exhibitions, or those who wish to advertise themselves (breeder or butcher), or, shall I say, those who are foolish enough to give it? But get it I am certain. Here then is a real, or an apparent, loss of thirty-five dollars. During these nine months the animal has been housed and all the manure consequently preserved. I sold, so to speak, the food to the consumer at a profit because it was at *market rates*, and hence very plainly I have no right to what the animal voided in this example — all belongs to itself. Now, first of all, the eight tons of manure thus obtained may be valued at the ordinary farming rate of the particular locality, and in Guelph is seventy-five cents per load of a ton, irrespective of quality, say six dollars. Gentlemen, I have rarely failed in convincing the sceptic on this somewhat irregular question in this manner: He has 100 loads of farm-yard manure in spring ready for root, or other green crop, or fallow, or top dressing. I require more than I have made and offer him seventy five cents per load; he simply looks astonished and says nothing; well, liking the quality of the material I rise to one dollar. You think, he says, I

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could haul twice a day from the city, pay seventy-five cents, and sell to you for one dollar? Why it costs me two dollars and scarce at that. Just so, I reply, in that case I will give you two dollars, and so you will be paid for your labor; he hesitates, my offer strikes him as good, $250 is a lump of money; my friend is a good practical farmer; but still he hesitates between greed of cash and the thought of *what he would do without manure.* Will you take two dollars and fifty cents a load? I cannot, he at length decides, because I don't know where to get more and the farm can't do without it. Thus have I "caught" those who doubt the practical value of farm-yard manure. That got from the high-priced steer is worth thirty-two dollars, according to the well known chemical standard of the food consumed, as well as tested by long practical experience.

And yet once more in these introductory notes: What is the best age and weight to dispose of beef and mutton as made under our conditions? The British market rules weight by demanding 1,400 pounds and 160 pounds respectively. It is not what we think is best, but what the market says — what the shipper also finds most suitable for transport — a finished 1,400 pounds steer or heifer, and a finished 160 pounds wether — no more and no less on an average. By finished is not necessarily meant maturity, but the weight named must make up a well fattened frame whatever the age. Now, as the best shipping time is May, it ought to be part of our management, as far as possible, to time breeding. As we gain experience in Ontario in this line of work we find there is no difficulty in making these weights at two years for cattle and one shear for sheep. Breed, food and good management say so. As an example of what may be called high pressure in fattening, allow me to give what is now on hand at the Ontario experimental farm.

With cattle the case is six steers, three each of first crosses by Hereford bull and Aberdeen-Angus bull respectively, upon short-horn grade cows. Their average birth was thirteenth July last year, so that they are now fourteen months old. They were well nursed, got extra food during milk and have been "soiled" all summer in a large open shed and court. Yesterday the average weight was 1,015 pounds which is a daily rate of nearly two and one-half pounds. Allowing a smaller rate as age advances, these animals will easily scale 1,450 pounds when one year and ten months old on thirteenth May next. Thus then, late calves, even three to four months later than is common, can be made all the size and finish required for the greatest market of the world. With sheep, the examples are first crosses by Cotswold,

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Leicester, Oxford Down, Shrops, South Down and Merino rams, with common ewes, dropped middle of March last year, shorn middle of April this year, and weighed 168 pounds at shipping in May.

Some think that early, or pre-maturing can be carried too far for profits. I am willing to test this with you now, on one condition — that you take no note of the value of manure as in favor of an older animal — if you do, I cannot; if you don't, I can make a lesson. Take the same steers and wethers just referred to. As regards the steers, will they pay best to dispose of for shipping this month, or to be kept until next May? They are worth five cents now and six and a-half in May. Shall we take fifty dollars per head in September, or ninety dollars in May? To winter from October to May will be forty-five dollars for *actual cost* — not market value — of food and attendance. I think no *fast work* can be done under five dollars a month, winter or summer. To the cost of production for the second winter may be placed interest eight months' use of money, or three dollars. Balanced upon these figures, the September sale gains eight dollars, a handsome sum of course with a large number of animals. As regards sheep the facts of early maturing are equally striking. Equal value per pound is what is got for two shear, or shearling fat wethers. A shearling of 168 pounds is worth nine dollars, and a two shear of 250 pounds will fetch fourteen dollars. To summer and winter the two shear costs seven dollars. As fleece is worth two dollars and fifty cents, on an average of kinds, so if allowance is made for interest or money, risks, etc., the difference of fifty cents in favor of the two shear is swallowed up several times. When manure is not valued therefore, pre-maturing pays, but, up to two and three years the manufacture of manure takes a high place. When everything is debited and credited in cattle feeding, a yearling returns a net profit of twenty dollars, a two year old forty dollars, and a three year old fifty dollars. After that there is, or should be, little or no increase to weight; the animal becomes a manure manufacturer only, and indeed the ten dollars in favor of the three year old is brought about mostly from manure value. In this calculation I do not make allowance for the gain of one year in every three by killing when two, in place of when three years old.

Having said so much more about beef than mutton, I ask your attention now for a time to the latter. If I am anything in agricultural love, I am a shepherd. In my view there is no line of the farmer's work at the present moment, even with wool so low, that pays so well, gives so little trouble, fewer risks, earlier returns, and in most ways makes things so comfortable as mutton and wool. Necessarily,

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our conditions are unfavorable to the *cheapest production* of these, though they are the most favorable for health and rapid production. Our winters compel us, as it were, to do well or let alone. So many let alone, that, north of latitude forty-two degrees we do not yet know how much we are able to do, but I am certain that the annual loss to the northern States and Canada by unapprehended, undeveloped, wool and mutton resources must be very large. The subject is not one admitting of any doubt, for there are few difficulties when viewed properly through the many physical conditions and particular breeds.

The first, important and most new thing I wish to submit, is with reference to wool. How few of us know anything about this crop, in all its great variety, and what it is that goes to make it according to kind. Ordinary management of sheep is too well known to require description, by which the wool is an unfed, untended, and badly harvested crop. During the last seven years I have closely studied the conduct of wool upon twelve distinct breeds, under similar conditions, by vigorous management, such a kind of management as is most likely to draw out all the virtues of wool as well as mutton, and have come to the conclusion that we are not realizing all we should under the circumstances. If you are satisfied with the usual stamp of mutton, and the weight and quality of wool so common on all hands, I ought to bow and retire, but trusting to popular cupidity, if nothing higher, permit me to say that, by experiments on foot at our station, most undoubted evidences are gathering to show the necessity, not the possibility, but the necessity, of clipping lambs once, and all other sheep *twice*, every season. This is nothing new in several parts of the world that are free of extremes of climate, but is such a strong departure here as to demand careful investigation, and possibly legislative recognition. Any practice that subjects domesticated animals, or any animals, to unnecessary suffering is highly reprehensible, but in this proposition there is not only no form of such a thing, but a decided relief-giving and increased well-doing.

Let us sketch what may ere long characterize our northern shepherding. Lambs come in March, and receive, with the ewes, all the necessary care in housing, food and good management, plenty of suitable food and proper accommodation. Four months on milk, with extra food in house and on pasture, will make a very independent lamb by the middle of July, when dipping, on the best pastures, prepares for shearing about the first of August. If the breed is a medium wooled one, such as the Shrops, which we take as an example, they will have a close coat three inches in length, that weighs three and one-half

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pounds, which, under any market conditions, will fetch *two cents per pound more*, in any breed, *because it is lamb's wool.*

There is a rapid reclothing of the shorn lamb, which by the middle of September acquires a thicker and warmer coat than it would have had without clipping; the animal has thriven better through the warm weather, is heavier than the average of his kind with the first wool on, and every way better prepared to fend the coming winter. Then the proper class of wintering in liberal feeding, with unconfined housing, will produce another fleece ripe for harvesting by the middle of April. Early clipping now is more important than at any other time of the animal's life; the vigorous growth of a well-done shearling makes a heavy, rich fleece, even as early as the first of March; in the coldest dry weather, between January and April, the *sweat-wet* wool is evidence of well-doing, and its removal both a matter of relief to the animal and a means of increasing the weight of mutton for the May market, and of adding to the vigor, size and health of breeding stock. Wool grows as rapidly on a well managed flock in early spring as in summer, so that by the first of August the shearling is again in possession of a dense pile of three and one-half inch wool that will clip four and one-half pounds. Ewes with lamb at foot, might need ten days' housing, with *open* doors, after the spring clipping, but nothing more. It is the food that supplies heat, and the damp weather that does harm — not the frost or the snow.

By a system such as this, subject to change, as experience may show to be best, the cultivation of wool and mutton would become something of high importance in comparison with the present practice, but, need I say that the *starving* plan has no chance here.

And still further, gentlemen, in addition to the extra weight of mutton and wool per annum, it will be evident to many of you that the character of the wool will be materially changed. Not to build too much upon the present demand for short and medium sorts in preference to long, it is known, nevertheless, that for most fabrics *medium* wool is always a safe investment. So to those, therefore, who hold long-wooled flocks, and who prefer them for other reasons than wool production, the semi-annual clipping must commend itself very strongly, because the wool will come nearer to the medium than the long, and fetch twenty per cent more value.

I leave this important subject in your hands, trusting to hear of its gradual, if not immediate, adoption everywhere north of forty degrees on this continent. This is the first time I have submitted the matter

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to any body of farmers, and, of course, I expect to hear of some criticisms ere long.

Having thus laid down a financial basis on the great question of fattening cattle and sheep during winter, bear with me for a short time on an off-hand sketch of foods, management and breeds.

What shall the food be? What should the surroundings be — what the management in all their important details? What do science and practice say?

Unquestionably, our conditions call for housing of a very superior character, and this is always the first consideration in any mode of farming, but particularly the fattening of live stock. Much money is not implied any more than other things; we desire to obtain warmth with thorough ventilation, and this ventilation must exist without currents. It is more dangerous to stand an animal in a draught than it is to subject it to extreme cold, and I feel assured that the cause of the somewhat prevalent animal consumption, or tuberculosis among cattle, and lung disease among sheep, is due largely to sudden variations of temperature in winter — brought about mainly by the over anxiety of many men in regard to the comfort, so-called, of their animals — who believe in having the thermometer at seventy degrees inside, when it stands at ten degrees outside. I think it is a clear mistake under any circumstances to shut the door on sheep — ewes just lambed excepted — and no science can convince me that an average temperature of sixty-five degrees is better than one of fifty degrees in winter. A damp, cold, temperature causes animals to consume more food without corresponding results in growth, because very much of it is used as fuel to keep up warmth, so, not only ventilation, but drainage and proper light are necessary towards the best results. Whether the cattle beast should be tied or have a loose box, cannot for a moment be doubted, when *economical* handling of a large number is so important. Health in its fullest sense may not be always a part of stall management, but in the case of beef management the kind of health implied by strength of muscle is not a matter of much account. No doubt the growing animal intended for beef requires a little exercise daily to promote strength, but when ripening, the same animal only needs to be able to walk to market.

Thus far satisfactory with our fattening animal put-up in October — proper housing being simply so much food. But now as to the food itself. If we follow nature closely, we should preserve nature's offerings in the shape of grasses, which in variety, as is well known by properly managed pasture, gives all that any cattle or sheep require

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both for fattening, or growth of youth. But good as our fodders are, in any form, whether timothy and clover, meadow hay or corn fodder, they are found to be too slow for the present purpose; they fatten just as well as anything else, but not fast enough. True, the best pastures of the world, under the best of conditions, will give a greater daily increase than any other form of food with young stock, but we are in North America, and the time is winter in this consideration.

I know, at the same time, that our fattening subjects are ruminating animals, and must have *bulk* of the rougher materials wherewith to chew the cud. The stomach must be filled with fodder, and not alone with sufficient nutritive value in small quantities, as can easily be done with other foods, such as grain. Here the theorist might easily commit a grave error, just as much as some chemists have done in assuming that certain concentrated fertilizers will grow certain crops, because they contain all the requisite foods for their complete maturing. The proper proportions and kinds of food are the points of great value in this study. We cannot set aside science in this work; practically, foods give results according to their chemical standing, when *combined or mixed to suit the particular animal system.* We have many examples of this. The great grain of the American land, called corn, is chemically higher than a mixture of peas and oats with that corn, yet the result in feeding is decidedly in favor of the mixture, as against the corn alone. Most foods are better in combination than alone, and the combination should be so arranged as to leave little or no waste. The kinds and proportions of food to suit each individual animal exactly, so that it shall just receive the best nutritive ratio, are not so easily struck as may appear to some. If we take the corn, peas, oats, hay, roots and bran, with cake, and look at them by their chemical analysis, it becomes a nice mathematical lesson to hit the life or heat forming materials that should accompany the flesh and fat forming materials, so as to secure this nutritive ratio. All the foods named have to be chemically balanced, and an agreement made with practice, for no amount of scientific knowledge can square off any animal's meals without a copartnership with the practical feeder. Grain, in all instances, regulates the feeding value of a diet, so that one or two pounds more or less per day has a greater effect than larger quantities of other forms of food. It is interesting to make the memorandum here, that experimental work with live stock, all over the world, differs materially in *special lines of inquiry*, such as feeding with one kind of

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cross; but when taken generally, such as feeding a large variety, as we are now discussing, the results are remarkably uniform.

How do you prepare your animal food — do you cut or steam, or feed rough, that is, uncut fodder or roots. With reference to these three forms of presenting food to cattle and sheep, I think there is little dispute about the following:

(1.) That uncut hay, or other fodder, and roots unbroken are most healthy, though less economical.

(2.) That cut fodder and pulped roots, mixed a-heap, and allowed to ferment slightly, so as to draw out sugary properties, are much more economical than any other form, and well adapted to both milking and beefing.

(3.) That the boiling or steaming of food for animals that chew the cud is the most unnatural, the least healthy, and does not give corresponding results in accordance with expense, unless upon the large scale.

The plan of pressing corn, or other material, as green fodder for winter, by ensilaging, carries common sense with it at any rate, whatever the feeding effects may be. I say may be, because as yet I think there are no sufficiently reliable and extended tests to build upon. I trust to be able to speak experimentally upon this next year, having arranged to stable several sets of cattle and sheep for the purpose.

When asked in what way I would prepare show animals so as to maintain health, acquire rapid weights, and uphold the manure pile, I say loose box, winter and summer, with prepared raw food.

I have never seen any ill effects from allowing animals to have all the water and salt they can take at all times, and nothing is more rational than to feed at least five times a day — giving proportionately little at a time. Because a man himself feeds thrice daily it does not follow that it must be best for all other animals. The little and the often is nature's lesson. Some are often in doubt as to what is called a *safe* quantity of grain per head per day, when pushing cattle and sheep for market. A good guide is one pound to every 100 pounds that the cattle, beast or sheep weighs. This is sound, scientifically as well, because most animals eat in proportion to their weight, under, of course, average conditions of age, temperature and fatness. It is also as true in practice, as it is given by lessons from nature, that change of food often is good, and yet dangerous to do so rapidly. To those who believe in a liberal allowance of turnips and mangolds, it should never be forgotten that our winter conditions call for more cautious work than British experience, and the rule with us should be just so much of these flashy green fodders, along with other things, as

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that the animal will drink little, if any, water — in some cases sixty pounds, in others not more than thirty-five pounds per day. The grooming of cattle may easily be overdone. When anxiety overruns common sense to the extent of disturbing the animals three times a day with the currycomb and brush, more harm than good ensues. To a tied-up animal the brush is indispensable, but never rouse them up for this purpose, nor in any form but one thorough grooming daily. Judiciously done this practice alone means four dollars per head more when market day comes.

Gentlemen, it is obvious from all we have advanced, that no matter what the nature of the farming is, or may be, in our half-summer, half-winter — whether dairying, grain growing, pasturing, or mixed — the production of beef and mutton will always form an important feature. With all her wealth of pasture and climate, Britain's Christmas and exhibitions would be little without the finished stall ox, and her abundant crops would bulk very much less without the grain-fed animals. While the grain fattened animal cannot show a balance sheet of the same kind as the grazier, it can tell of a purpose and work — a higher aim in life than the other. The immense extension of ranching will never shut out the grain grower from successful competition in butcher's meat. The grazier can say halt at any time, and no associated branch of industry need suffer much, if at all; but to the grower of crops, even one year's cessation of stall work would mean a serious blank in our national wealth. I am not overlooking the other great field, open only to you and Canada in the live stock interest, that is, breeding for others. I hold that no part of this great continent can rear animals for breeding purposes so reliably as the Northern States and Canada. The purifying, invigorating, toning and healthy character of our winters is so remarkable as to be overlooked simply because of its almost total immunity from disease. Were diseases conspicuous, then the world would hear more of us. But we are not doing our duty in producing acclimatized cattle and sheep, and hence the present unnecessarily high prices for pure bred animals. The present breeders are not to blame for this, but the crop growers, who could easily rule the market. The market is practically unlimited, and no one need hesitate about a choice of breed when the individual condition and wants are intelligently reasoned.

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INSECT ENEMIES OF FRUITS.

A Paper read before the Society, at Rochester, September 18, 1883,

BY J. HENRY COMSTOCK,
Professor of Entomology, etc., in Cornell University.

I have been invited to address you on the subject of *The Insect Enemies of Fruits.* It seems to me that no topic could be more appropriate at this time for the consideration of a body of agriculturists, meeting at the centre from which millions of fruit trees have sprung.

I will not weary you with statistics as to the magnitude of the fruit-growing industry, for of this you know. Neither will I try to tell you of the amount that is lost annually by the ravages of insects, for of this you have some appreciation, else you would not be here. Still I think it would be difficult for any of us to get a clear idea of the full amount of this loss. Think of the proportion of apples and pears which are wormy; of the plums and cherries that are ruined by curculios; of trees of different kinds that produce only a fraction of a crop, owing to loss of roots, or foliage, or to the presence of borers in the trunk, or to the millions of aphids and scale insects sucking their nourishment from leaves and bark; and to think of the number of trees which are killed outright by various kinds of insects.

We will take for granted, however, that all this is understood and appreciated. The question then arises: What can the fruit growers do and reduce this loss to the minimum?

The plan of warfare against insect pests which is undoubtedly the best, requires concert of action over a considerable area. When an individual, or only a few persons in a neighborhood, try to keep noxious insects in check, they can only hope to be partially successful. The degree of success which can be obtained in this way varies greatly, depending on the species of insect in question. Thus certain insects can spread readily from orchard to orchard, while other species may remain for many years in an orchard without being able to spread to another only a few rods away. Although I believe it will pay any fruit grower to do all he can to destroy the pests in his own orchard, even if his neighbors breed insects with which to restock it, I wish to show you what can be done by concert of action.

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Fortunately it is not necessary for me to give you an ideal picture. I have only to tell you what the fruit growers of another State have done.

California, as you know, is a great fruit producing State. There as in other States, until recently, almost nothing was done to prevent the introduction, spread and increase of noxious insects. The result was that when I visited the State three years ago, I found many magnificent orchards completely overrun by insects. So great was this scourge in some of the fruit growing sections that the price of real estate was seriously affected by it. I will instance the Santa Clara valley in the vicinity of San José. This beautiful valley, one of the finest fruit growing sections it has been my fortune to see in journeys extending over the whole length and breadth of our country, was so overrun by scale insects and other pests, that many of the residents were greatly discouraged, and people from other sections were loth to invest there.

Fortunately for the fruit growers of that section, and I believe for the world, there were among their number some very enterprising, energetic men — men who when once awakened to their danger are not the kind to sit quietly and let their property go to destruction, or to give up in despair because their enemies are numberless.

The grape growers of the State had already been aroused by the discovery that that terrible scourge of the vine, the *Phylloxera*, was among them; and an act had passed the Legislature and become a law establishing a Board of State Viticultural Commissioners. One of the duties of this board was to devote special attention to the study of the Phylloxera and other diseases of the vine. But under this first law this board could only investigate and advise; and the scope of their duties was confined to the viticultural interests of the State.

This commission, therefore, could not be expected to do anything for the scalebug-infested orchards of San José. But the fruit growers of that section were competent to do for themselves. They held councils of war and settled upon a very wise course of action, as subsequent events have shown. The most serious pests they had to contend against were scale insects. These creatures, at that time, had been studied but little in this country. In fact the two most common species that were overrunning the San José orchards were unknown to science until I described them a year later. Various means of destroying scale insects had been suggested. But no one of the proposed remedies was backed by sufficiently extensive experiments so

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that it could be confidently recommended. The plan decided upon was to carefully test each of the measures which had been suggested or could be devised. A large number of trees were treated with the various washes and the effect, both upon the trees and upon the insects, carefully noted. These experiments were conducted with great care by a committee and the results published in the local papers. The experiments were conducted on so extensive a scale that the committee were able to decide quite confidently upon the best method of destroying the pests.

In the meantime the fruit growers of other sections of the State became aroused, and by their united action legislation "to protect and promote the horticultural interests of the State" was secured.

The duties and powers of the Board of State Viticultural Commissioners were enlarged. It became their duty, in addition to laboratory work, to cause practical experiments to be made to determine or demonstrate the utility of known and new remedies against the diseases and pests of grape vines. They were directed to appoint a competent person to serve as chief executive viticultural and health officer. This officer was given power, subject to approval of the board, to prevent the introduction and spread of vine diseases and vine pests by declaring and enforcing rules and regulations in the nature of quarantine. Willful violations of the quarantine regulations of the board were declared a misdemeanor, and are punishable by a fine. The board was also directed to appoint an officer who should be especially qualified by practical experience in horticulture to perform duties respecting the protection of fruit and fruit trees similar to those required of the chief executive viticultural officer in reference to grape vines. Appropriations of $10,000 a year have been given this board with which to carry out their work.

As illustrating the quarantine regulations of the board I will quote some of their rules:

"RULE 1. All cuttings of grape vines made in this State for sale, gift or distribution outside of the vineyard or vineyards where the same were grown, and intended for new plantations, shall be made solely of the wood of the preceding year's growth; all older wood to be carefully and thoroughly removed before leaving the vineyard where made. * * * The reason for this rule is that the winter egg of the phylloxera vastatrix is, according to the best authorities, found only on the old wood."

"RULE 2. All cuttings of grape vines and rooted grape vines imported from any region or country outside of this State, intended

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for sale, gift or distribution for plantation in this State, shall be disinfected at the place of first consignment within this State before being further distributed or planted, the method of disinfection to be at the option of the owner or agent in charge of the said cuttings or vines according to any one of the following methods, viz.:"

Then follow details of six different methods of disinfection and the statement that "any other efficacious method may be used provided due notice is given to this office and the same be approved."

Rules were also issued respecting the prevention of the introduction and spread of diseases and pests of fruit trees.

About the time that this law enlarging the duties and powers of the Board of Viticultural Commissioners was passed, another law was enacted providing for the appointment of county boards of horticultural commissioners. The more important parts of this law are as follows:

"Whenever a petition is presented to the board of supervisors of any county and signed by five or more persons, who are resident freeholders and possessors of an orchard, or both, stating that certain or all orchards, or nurseries, or trees of any variety are infected with scale bug, codling moth, or other insects that are destructive to trees, and praying that a commission be appointed by them, whose duty it shall be to supervise their destruction, as hereinafter provided, the board of supervisors shall, within twenty days thereafter, select three commissioners for the county, to be known as a County Board of Horticultural Commissioners."

"It shall be the duty of the County Board of Horticultural Commissioners in each county, whenever they shall be informed by complaint of any person residing in such county that an orchard, or nursery, or trees, or any fruit-packing house, store-room, sale-room, or any other place in their jurisdiction, is infested with scale bug, codling moth, red spider, or other noxious insects, liable to spread contagion dangerous to the trees or fruit of complainant, or their eggs or larvæ, injurious to fruit or fruit trees, they shall cause an inspection to be made of the said premises, and, if found infected, they shall notify the owner or owners, or the person or persons in charge or possession of the said trees, or places, as aforesaid, that the same are infected with said insects, or any of them, or their eggs or larvæ, and shall require such person or persons to disinfect the same within a certain time to be specified. If, within such specified time, such disinfection has not been accomplished, the said person or persons shall be required to make application

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of such treatment for the purpose of destroying them as said commissioners shall prescribe. Said notices may be served upon the person or persons owning or having charge or possession of such infested trees, or places, or articles, as aforesaid, by any commissioner, or by any person deputed by the said commissioners for that purpose, or they may be served in the same manner as a summons in a civil action. If the owner or owners, or the person or persons in charge or possession of any orchard, or nursery, or trees, or places, or articles, infested with said insects, or any of them, or their larvæ or eggs, after having been notified as above to make application of treatment as directed, shall fail, neglect, or refuse so to do, he or they shall be deemed guilty of maintaining a public nuisance, and any such orchards, nurseries, trees, or places, or articles thus infested, shall be adjudged, and the same is hereby declared a public nuisance and may be proceeded against as such. If found guilty, the court shall direct the aforesaid County Board of Horticultural Commissioners to abate the nuisance. The expenses thus incurred shall be a lien upon the real property of the defendant."

It is now two years since the passage of these laws, and the publication of the results of the experiments of the San José committee already referred to. Short as is this time the results brought about during it are wonderful. The growth of public opinion has been towards a hearty support of this war against insect pests. And at the last session of the Legislature a State Board of Horticulture was established. Chief among the duties of this board is the carrying on of this war.

I can best give you an idea of the results ot the two years' work by reading a letter which I recently received from Dr. S. F. Chapin, one of the San José committee of experimenters, and one of the most energetic workers in this cause. Dr. Chapin is now vice-president of the State Board of Horticulture, and also the inspector of fruit trees. The letter is as follows:

"Your favor of the sixth August received. I send you copies of the laws we have relating to horticulture. At the last session of our Legislature a penalty bill was passed which failed to reach the Governor for his signature, and so was lost. This latter was a companion bill to the one I send you, which became the law creating a State Board of Horticulture. You can better understand from this explanation how it is that we do not have a law which allows coercion to any extent; but I am not so sure that the coercive measures are always the best. The people, as a rule, are willing to do what they

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can to support a reasonable law for the protection of horticulture, and the growers are generally ready to take the needed steps to protect their own industry. The greatest difficulty in the way, as a rule, is from those who have but a few fruit trees, and whose pecuniary interests do not depend upon the fruitfulness of those few trees. Then even it is more from lack of knowledge than willful inattention that they are indifferent. I must say that in connection with my official visits through the State, I meet only with a welcome and friendly interest in this work. The instances of positive opposition cannot yet be expressed in the plural. The general desire among orchardists is for information upon all these subjects so important for their interests, and they readily adopt any and all good things."

"I am happy to say that by the various means adopted by the California growers, most of our serious fruit pests are being held in subjection and suppressed to so great an extent that where the effort is carefully made, large crops of very choice fruit are being gathered where two or three years since an almost total failure was experienced. Notably is this the case here at San José, and in orchards with which you are familiar. The scale insects are now overcome by those who make the effort; and it is now a fact that they have been exterminated in some orchards, and practically so in very many."

"This work has been done almost wholly by the judicious applications of concentrated lye. This is par excellence *the* remedy. No one here now thinks of any other remedy in which *that* does not enter. Coal oil is not now used in California for that purpose, unless it be in extremely limited instances. I can name orchards here at San José in which trees are now being dug out which were washed with coal oil two years ago; trees which, at the time, were not killed and which were thought to have escaped harm from the oil, but which have this season died. I take from my note book an example. In 1881 Mr. S. D. Parkhurst, of the Willows, San José, washed 160 Newtown pippin trees, ten years old, with coal oil wash, without injury at the time, as he thought, to those particular trees, while immediately injuring, and even killing, thirty-four white winter Pearmain trees treated in the same manner and from the same barrel of wash. August 1, 1883, Mr. Parkhurst informs me that out of those pippin trees washed a great many have died, and he had just dug out fifty of them."

"Regarding the codling moth, the careful methods so clearly demonstrated the past season as successfully combating that pest, have been practiced this season by many growers and have been successful

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beyond anticipation. Those who have faithfully followed out the instructions given in the paper on codling moth, read before the State Fruit Growers' convention of last year, have succeeded, and will save finally ninety per cent. of sound apples and pears of their crops. As we here, owing to lack of rain during the fruit season, cannot use the poisonous applications of Paris green used in the East, adopt other methods."

"In addition to those means I have enumerated, some are finding assistance also from the use of cans hung up in the trees and partly filled with this mixture: Molasses, one part; cider vinegar, two parts; water, four parts."

"I have examined in numerous instances the cans containing a large number of insects, moths and flies of all kinds, and have found a great many of the codling moth; so that it is a proved success in catching many moths. Though how many of the moths have previously deposited their eggs cannot be told except by the general diminishing of their visits to the fruit."

"I may instance for our State the fact that last year the fruit sold amounted to eight millions of dollars, and this year will considerably exceed that amount. In our county of Santa Clara, the fruit product as returned to the county assessor was $1,611,800; while two years ago the value was returned at $976,475. The assessment of the county has an increase over last year of $3,552,529, and, as is stated, principally owing to the fruit interests and increased value of fruit lands. How much of this increased prosperity is due to the effectual means for overcoming injurious fruit insects can never really be told, but its influence is vast. This is but for a single county, and it can be seen how important is the welfare of our orchards. The future of California fruit-growing is bright providing that the market returns a proper remuneration to the intelligent horticulturist."

To me this letter is filled with hope for the horticulturists who have to contend against insect pests. When I recall the terrible condition in which the San José orchards were in 1880, and the bad reputation the section was rapidly gaining among investors in fruit lands, I do not wonder that the assessed value of the county should suddenly increase more than three and one-half millions as soon as it was proven that the orchards were being freed from insects; or that there should be an increase in the value of the fruit crop from nine hundred thousand dollars to sixteen hundred thousand in a single year, when an intelligent and energetic effort was made to destroy the codling moths and scale insects. Could a better demonstration of

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the feasibility and desirability of concert of action in these matters be asked for? In another respect is the account given in this letter very encouraging. It shows that it is possible to educate public opinion so that it will sustain measures like those adopted in California. I know that those who led this crusade against noxious insects in that State did not find clear sailing at first. They were opposed by those who really are the ones that have been most benefited by their work. Many short sighted persons were anxious to conceal the fact that their orchards were overrun by pests. They have learned, however, that it is better to go to work and clean their orchards than it is to profess they are clean when they are not.

Is this experience of the fruit growers of California worth anything to the fruit growers of this State? I leave the question for you to answer. You must judge whether it be of value to you or not. I have felt that I could not do better than to tell you of it, and now I leave the matter with you.

I wish, however, to urge upon you the desirability of concert of action on a small scale if we are not to have State action, or while such action is being brought about. Let the people of a town unite and wonderful results could be obtained. If a whole town cannot be brought to take steps of this kind, then let a neighborhood unite, or even two or three neighbors. But where concert of action cannot be had, I believe it will pay *individuals* to do what they can to rid their orchards of pests.

When a fruit grower determines to fight the insects in his orchard, his first step should be to ascertain just what insects he has to contend against. He should then learn as far as possible the complete life history of these insects in order to thoroughly understand and carry out the remedies which have been proposed, or to devise new remedies. I have known a great deal of time and expense to be wasted through failure to take these precautions. A few weeks since I saw pear trees which were bandaged last spring, but the bandages had not been examined since. Of course the only result had been to aid the codling moths in undergoing their transformations. In a neighboring orchard the plum trees were carefully bandaged in a similar way with the vain hope of preventing the ravages of the curculio.

There has been, however, some excuse for failures to obtain definite knowledge respecting these matters. Every fruit grower cannot be expected to be an entomologist; and the published data respecting noxious insects have been so scattered through various scientific journals and government publications that only a specialist could keep track of

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them. It is true that many of our agricultural papers have done their best to keep their readers informed regarding these matters; but unfortunately the majority of the subscribers to such papers do not preserve either files of their papers or cuttings from them. Consequently it usually happens that definite information is not at hand when it is needed. In these latter days this difficulty is being overcome by the publication of treatises on special subjects. The list of such works relating to horticulture is a long one. And I wish to call your special attention to one of the recent additions. Lippincott & Company, of Philadelphia, published this season a work entitled, Insects Injurious to Fruits, by William Saunders. This is just the work which each one who is interested in the subject before us should have access to. In fact I believe it to be the best single work on entomology which the American fruit grower can obtain. The author is an able entomologist, and a fruit grower of wide experience. The work is written in a clear, simple style; the illustrations are nearly all beautiful and accurate, and the arrangement of the topics is one that will render the work very available to practical horticulturists

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SOIL TEMPERATURES.

By WINTHROP E. STONE, of Houghton Farm.

The temperature of the soil is so important an element in the growth and maturity of plants that it is worthy of large consideration; it is to the roots, what the temperature of the air is to the foliage, while the indispensable co-operation of these most essential organs depends outright upon the relative temperatures of the soil and air; it influences the whole life of the plant, hence the study of its governing laws and principles is an exceedingly important one.

A series of investigations has been instituted at Houghton Farm for the purpose of acquiring a better knowledge in this field. Our records already contain the results of frequent and systematic observations of two seasons, but these, of course, cannot be considered conclusive. No single repetition of observations upon physical phenomena can be regarded as decisive, and with this fact in view it is designed to obtain a large amount of data and repeated experience before attempting to deduce laws. Many interesting facts have been observed, however, and it is the purpose of this article to give a brief review of observations which have already been discussed at greater length in published reports.

The method used for obtaining the temperature of the soil at various depths is as follows: Accurate thermometers are secured in the hollowed extremities of light wooden rods, and these are inserted to the required depths in closely fitting zinc tubes from which they are easily withdrawn for reading. The thermometer bulbs are enclosed in cisterns of oil to prevent the too rapid effect of the air temperature upon the reading of the mercury when withdrawn. The zinc tubes are filled with water which surrounds the thermometers and prevents the conduction of heat from above. In this way thermometers are permanently located at depths of three inches, six inches, nine inches, one foot, three feet, five feet and eight feet, while the surface temperature is obtained from a thermometer with its naked bulb just covered with loose particles of soil. These are read hourly from 7 A. M. to 9 P. M. during the months from May first to November first, this being the time of agricultural operations in the soil, while there are, besides, obvious difficulties in the way of continuing the observations through

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the winter. From a set of meteorological instruments, the temperature and relative humidity of the air are also taken hourly, together with the amount of clouds, direction and force of wind, rain-fall, etc. The soil in which these thermometers are located is a clayey gravel at the surface, gradually merging into a compact clay from three feet downward. The surrounding surface is kept free from vegetation, uncultivated and undisturbed during the season.

In addition to the mercurial thermometers, an electric thermometer was constructed in the spring of 1883 and has been in operation in connection with them during the past season. Its essential features are as follows: Thermo couples are formed by soldering copper wires to a main iron wire at the required depths; these are placed in the ground in a water-tight tube filled with dry sand. The wires are continued into the office where the circuit is completed by a single couple, the copper member of which is connected with any of the copper wires from without by means of a switch board. This office couple is located in a well which is connected with reservoirs of hot and cold water. A sensitive galvanometer is introduced into the line of iron wire. If now the circuit be closed by connecting, on the switch board, with a copper wire belonging to a couple any depth in the soil, any difference in temperature between the soil couple and the office couple will be indicated by a deflection of the needle of the galvanometer, to the left or right, as the case may be. Hot or cold water is then introduced into the well containing the office couple until the needle rests at zero, showing that the electric current has been balanced and the temperature of the two couples is identical. A thermometer hanging beside the office couple now gives its exact temperature, and consequently that of the one in the soil. Other depths are brought into the circuit by means of the switch board and the operation of balancing the current is repeated. It will be seen at once that this apparatus has a great advantage over the arrangement of mercurial thermometers in its convenience, dispensing with the necessity of out-door observations in bad weather; this, too, makes it possible to continue observations during the winter months. The apparatus not only is a novelty but proves itself a decided acquisition to our resources.

So far as agricultural operations are concerned, the sun is the principal source of heat in the soil, though chemical changes produce an appreciable effect, but the amount of heat absorbed from the sun's rays does not by any means determine the temperature of the soil; other natural causes, radiation from the surface, the presence and amount of moisture in the soil and air, and the color, as well as the

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chemical and mechanical condition of the soil itself, all have a modifying influence.

Naturally, the temperature of the soil, following the changes in the air, is constantly fluctuating, and we observe hourly, daily and monthly variations. The first are confined to the upper layers of the soil with which our crops have to deal and are often sudden and violent. They may be produced by a variety of causes; for instance: A sudden shifting of the wind from south to north and clearing up of a cloudy sky just at sunset, caused a fall of 24° Fahrenheit in one hour; a sudden shower caused a fall of 16° Fahrenheit, and the hiding of the sun by clouds, a fall of 17° Fahrenheit in one hour, in the temperature of the surface soil. These changes lose their abruptness as they penetrate below the surface until at a depth of one foot there is rarely a variation of more than one degree in an hour.

In the same layers of soil which are subject to hourly variations, there is also a wide range of temperature in every twenty-four hours, caused by the absorption of heat during the day and its radiation by night. This range is greatly reduced if the sun be obscured during the day, if it be rainy, or if the soil is filled with moisture. The surface soil is subject to these variations in much the same degree as the air, and the range is often 40° to 50° Fahrenheit in twenty-four hours during the hot summer months, while it may be as small as 5° Fahrenheit, rarely less.

On an ordinary summer day the maximum temperature at the surface comes about midday and the minimum a little after midnight. These extremes occur later at the successive depths below the surface until at one foot they are retarded from eight to ten hours, and we have the curious feature, at evening, of the one foot thermometer still rising while that at the surface is falling, and again in the morning their movements are reversed. The daily, like the hourly variations, lose their intensity below the surface, but they penetrate to a greater depth. At one foot the daily change is marked; three feet seems to be the limit of its penetration, even during the days of greatest range.

Both the daily and hourly variations are lessened by the presence of moisture in the soil. During the six months' continuous observations the greatest extremes occur when the soil is parched with drought.

Beginning in the spring there is a constant rise in the temperature of the soil, *i. e.*, the average daily temperature is higher each day than on the preceding, for one foot or more in depth. Nearer the surface the daily average fluctuates with passing changes of the weather, but lower down the upward movement is unbroken as indicated by the

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three feet, five feet and eight feet thermometers, until sometime after the maximum heat of summer has passed; then comes the decline, proceeding at the same steady rate. So uniformly does this rise and fall progress that if it were graphically represented we should have a broad, easy curve rising from May to July and August and then falling in the same manner. It is noticeable that this increase and decrease of average daily temperatures is greatest during the spring and autumn months when there is most moisture in the soil. Of course this is largely explained by the fact that the soil is passing from one extreme of temperature to another by rapid transitions, but the influence of constantly varying amounts of watery vapor in the soil, produced by evaporation, must not be overlooked. This rise and fall of temperature with the progress of the season, extends to a depth of eight feet and probably lower, but no temporary decline at the surface was observed to penetrate below three feet, and rarely to this distance. From three feet down there was a constant and unbroken rise from May 22 to September 1, in 1882, and from the beginning of observations, May 1, to August 4, in 1883. At the depth of eight feet the temperature did not begin to fall until September 23, in 1882, and September 20, in 1883.

The mean temperatures (in degrees Fahrenheit) at various depths from May to November during the two years' observations are as follows:

1882.

	Air.	Surface.	3 in.	6 in.	9 in.	1 ft.	3 ft.	5 ft.	8 ft.
May	52.1	54.3	52.9	51.8	51.6	50.5	47.3	45.7	44.8
June	67.8	73.0	71.2	69.1	68.7	67.3	66 0	54.1	51.3
July	72.5	76.6	76.8	74.5	73.9	71.8	66.0	61.9	54.7
August	68.4	74.4	74.7	73.8	73.6	72.7	69.6	66.6	66.4
September	63.7	64.4	64.4	65.7	66.0	65.7	65.7	64.9	60.6
October	54.3	54.9	54.9	56.5	57.6	57.0	59.4	59.0	58.6
Means	63.1	66.3	65.8	65.2	65.2	64.2	62.3	58.7	56.1

1883.

	Air.	Surface.	3 in.	6 in.	9 in.	1 ft.	3 ft.	5 ft.	8 ft.
May	62.9	66.7	60.8	57.0	57.0	55.2	50.2	44.8	43.7
June	73.9	79.5	74.3	70.5	70.0	68.2	61.2	57.0	50.5
July	75.9	80.8	76.6	72.9	72.3	70.5	66.7	62.2	55.6
August	72.7	80.1	74.5	70.2	69.3	68.5	66.9	63.7	58.5
September	64.8	72.7	66.7	63.7	62.8	63.9	64.2	62.2	59.2
October	52.5	55.6	52.5	51.1	51.4	51.4	55.9	56.5	57.9
Means	67.1	72.6	67.6	64.2	63.8	63.8	60.8	57.7	54.3

The averages for 1883 are lower than those for 1882. The difference we may safely ascribe to the greater amount of water in the soil the latter year. This is shown by the rainfall for the two years dur-

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ing the months of June, July and August, the time of highest temperatures and consequently that which most seriously affects the averages. The figures are as follows:

	June.	July.	August.	Totals.
1882.....	3.90 inches.	2.19 inches.	0.99 inches.	7.08 inches.
1883.....	4.92 inches.	5.39 inches.	2.91 inches.	13.22 inches.

With the decline of summer heat the surface layers of the soil cool rapidly and the relations of the different depths become reversed, the daily averages at and near the surface becoming less than those at greater depths. This is well illustrated by our observations in October of both years. During this month, in 1882, the temperature at eight feet was higher by 3.7° Fahrenheit; at five feet, by 4.1° Fahrenheit; at three feet, by 4.5° Fahrenheit, and at one foot, by 2.1° Fahrenheit, than the average at the surface. In 1883 the same difference was noted, though in a less marked degree. From this it appears that during the autumn months, when the temperature of the upper layers of the soil is falling, there is a stratum of subsoil, beginning at a depth of one foot, or lower, as the cooling off at the surface progresses, and extending to an indefinite depth, which is from two to four degrees higher in temperature than the surface; and if we consider that this excess is constantly being radiated upward, we shall see that this warm zone, or the stored up heat which it contains, must have a decided effect in elevating the surface temperature and prolonging the season. In the same way the heat absorbed from the sun each day, by its radiation during the night, averts frost and maintains more nearly an even temperature.

As already noted the amount of moisture in the soil has a decided effect upon its temperature, but just what the value of this influence is we do not know; nor is it easy to determine, since there is no way, as yet, of ascertaining the amount of moisture present. We plainly observe its effects in extreme cases, but even then our conclusions can only approximate the truth; and, all things considered, this factor is the most difficult with which we have to contend in our study of soil temperature.

As in all other questions relating to the soil, the study of this can only be completed by devoting to it a succession of years, and it is to be hoped that some new facts, or at least corroborations of present views, will reward the efforts expended in their search.

Note.—The records quoted are all from the observations at Houghton Farm, in the township of Cornwall, Orange county, just seven miles due west from the Hudson river, at West Point.

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THE BUYING AND VALUING OF MANURES.

BY DR. A. P. AITKEN,
Chemist to the Highland and Agricultural Society of Scotland.
[From the Transactions of the H. and A. Society for 1883.]

Among the many advances made in agriculture during recent years there is none more important than the use of artificial manures and feeding stuffs as a means of increasing the fertility of the soil and the production of the farm. Since the introduction of the use of bones and guano, not much more than forty years ago, the number of concentrated manures, the quantity purchased and the area over which they are employed have gone on rapidly increasing. The importation of manurial substances into Scotland at the present time cannot be set down at less than 100,000 tons annually, and the manufacture of the raw material into manures suitable for application to the various soils and crops of the country has given rise to a vast industry in which an enormous amount of capital is employed.

The amount of money spent by the farmers of Scotland in the purchase of manures cannot be reckoned at much less than one million sterling annually, and everything which tends towards a more profitable investment of so vast a sum is a direct gain to agriculture.

It would be very useful if accurate statistics were obtainable of the amount and character of the manures employed not only over the whole country, but also in the different districts of the country where special conditions of soil and climate prevail, and where various systems of agriculture are practiced. We should thus learn what are the kinds of manures which experience has shown to be best suited to the circumstances of each district, and from a special study as well as a general survey of the details thus supplied we should obtain a better grasp of the subject of manuring, and be able to point out more confidently the directions in which farmers variously situated might, with benefit, modify their practice.

The nearest approach to a means of obtaining such information is to be found in the returns now being annually made to the Highland and Agricultural Society by analytical associations throughout the country. Most of these associations have been in existence for only a

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few years, but they have already been very beneficial, and their number is steadily increasing as their utility is becoming better known. Their chief object is the protection of their members against the purchase of manures and feeding stuffs inferior in quality or exorbitant in price, and the success which has already attended the operations of the older associations is attested by the excellence of the materials purchased by their members and the favorable terms they are able to obtain.

The manner in which an analytical association is constituted and conducted is somewhat as follows: The farmers in a district pay into a common fund a small subscription of from five shillings to ten shillings annually, or it may be a small assessment of about two shillings and six pence per 100 acres of arable land occupied by them, and the fund thus provided is chiefly expended in the payment of analyses, in defraying the cost of the publication of analytical reports, instructions, schedules and other literature connected with the work of the association. Besides the usual office-bearers, a committee is appointed to superintend the sampling of manures, etc. When manures are bought by members of the association they are sampled in the presence of witnesses, according to prescribed regulations, and the samples are sent to the secretary. These, or a selection of them, according to the amount of the funds, are sent to the chemist for analysis. In an old-established association the probable number of analyses required is known, and the funds are regulated accordingly. Each sample as it is received is analyzed, and a printed slip is sent to all the members, intimating the purchase, the guaranteed and found analyses, the names of the buyer and the seller, the price at which bought, and the value as determined from the results of the analysis. By these means all the members of the association are immediately informed of the quality and value of the purchases made by any one member, and are therefore guided in making their own purchases.

This method of procedure, beneficial as it is, is by no means perfect, as it does not entirely prevent the occurrence of unfortunate purchases, and it will be seen in the sequel that such purchases, made through the agency of analytical associations, are far from rare.

Another system of buying, which is simpler and less expensive in its method, and at the same time more satisfactory in its results, is practiced in some districts. This is the co-operative or club system. Neighboring farmers, whose wants are somewhat similar, meet together and intimate what are the kinds and qualities of manures and feeding stuffs they purpose buying. The total amount of each

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kind of material is determined, and various manure merchants are invited to quote the prices at which they are willing to supply these. The merchants send in their offers, along with samples of their stuffs, and their guaranteed analyses. The samples are numbered and sent to a chemist, along with the guarantee and price of each.

The chemist, without making a chemical analysis, carefully examines the samples, and applies a few qualitative tests to prove their genuineness. He gives an opinion of their relative excellence, and determines their relative values. Guided by his report, the farmers make their selection, and having made a careful contract of purchase, so as to prevent any misunderstanding or risk of loss if the bulk should not turn out equal to the samples, the purchases are made through one of their number acting as secretary for the time. When the goods are delivered samples are drawn in the presence of witnesses and sent to the chemist to be analyzed. On receiving his report the conditions of purchases are implemented, and cash paid within a month from the date of delivery. By this means the best manures in the market are able to be bought on the most favorable terms, no expenses are incurred in connection with the association, the number of analyses required is reduced to the minimum, and the cost of these to each of the buyers is a mere trifle. But the greatest advantage gained by this mode of procedure is the almost perfect protection which it affords against the making of unfortunate purchases. In ordinary circumstances the chemist is employed to discover mistakes after they are made, and his report usually comes too late to permit of the mistakes being remedied.

The usefulness of the work in which analytical associations are engaged was brought under the notice of the Highland and Agricultural Society two years ago, and its assistance and patronage were requested to enable the associations to carry on their operations more efficiently. The society answered their appeal in the most liberal manner, by granting from its funds a large annual subsidy, by framing a set of regulations for the better attainment of the objects they have in view, and by supplying the materials of a working scheme, and accepting the responsibility attached to the carrying out of its provisions.*

There were fourteen analyses disqualified in 1881 on account of the want of a sufficient guarantee, while last year there were only five. It cannot be too strongly urged that the obtaining of a sufficient guar-

* Several paragraphs, mostly of only local interest, are here and subsequently omitted.

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antee with every manure and feeding stuff purchased is absolutely necessary in order to prevent disappointment and loss in the purchase of these materials. A farmer may be able to trust his experience, his powers of discrimination, or intuitive perception, so far as to induce him to buy a horse without a guarantee of its soundness, or to engage a servant without a character, but these guides will avail him little in buying a manure without a guarantee, or a "pig in a poke," for the two transactions are of a very similar order. There are some manures, such as crushed bones, where, to a certain extent, "seeing is believing," but these are usually manures in a form which it is not economical to apply. The best manures are those in the finest condition, so finely ground or dissolved that their particles cannot be judged by the eye, nor their composition determined by ordinary superficial tests. Even chemists and manure manufacturers, who have hundreds of manures passing through their hands, trust their powers of observation to the most limited extent. Fineness of division and excellence of manufacture are, no doubt, matters of observation, but qualitative tests beyond the sphere of ordinary observation, and quantitative analysis which is the special province of the chemist, are required to enable one to pronounce an opinion on the value of a manure. In some respects the more one can see in a manure the less valuable it is, and the presence of recognizable lumps of material, especially in a dissolved manure, ought to be considered a disqualification rather than otherwise. But farmers who are guided by observation naturally give the preference to a manure containing something that they can recognize. They also like to see a manure as light in the color as possible, though that has absolutely nothing to do with its value. Some of the richest manurial substances are very dark colored, and bone char, which is often used as a constituent of the highest class superphosphates, is perfectly black. Yet it is found that a light-colored superphosphate commands a higher price than a dark-colored one of equal or even of greater value. Farmers are apt to judge manures somewhat in the same way as they would judge grain, hay or straw, and give the preference to that which has the "finer" color. These are fancies that only mislead and do harm in various ways. They form a temptation to manufacturers to bait their manures with a sprinkling of bone which gives them a fictitious value, and no one can blame them for so doing, as it is not their business to instruct the farmers; their business is to make whatever sells best, to cater for the farmer's wants, and he wants to see a few bits of bone. The preference for light-colored manures does harm in two ways — by causing substances to be added to manures which,

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improve their color without improving their quality, and in restricting the use of dark-colored materials of good manurial value.

It is right that farmers should see samples of the manures they buy, but they should not be guided too much by appearances which are apt to be deceptive, and they should also remember that in many cases small samples are apt to be better than the bulk, for in the process of sampling the texture of the manure is considerably, but unavoidably, improved. A chemical analysis is required in order to prove the value of a manure, and the obtaining of a sufficient guarantee is the only way to prevent loss from the purchase of a manure which analysis shows to be of inferior quality. But the important question arises: What is a *sufficient guarantee?* In the reports before us there is abundant evidence that this is a thing not well understood. Many of the guarantees are expressed in such a way as to give no security to the purchaser, some are very ambiguous, and it is usually found that the ambiguity is of such a kind as to make the manure appear more valuable than it really is. There can be no doubt that farmers are misled by such guarantees. One might hesitate to go so far as to affirm that such reports were drawn up with the deliberate intention to deceive, but it is a notable circumstance that in almost all cases where misleading guarantees are employed they are attached to manures which combine high price with low manurial value.

The very various ways in which chemists have been accustomed to express the results of their analyses, has undoubtedly had the effect of preventing farmers, unskilled in chemistry, from more rapidly acquiring a correct estimate of what is meant by a sufficient guarantee. It has tended to prevent farmers from making use of analysis as a test of their manures, because they know that if they received a chemist's report, they probably should not be able to understand it. One analysis is to them just as good as another, and one unfortunate result of this is that worthless wares are sometimes forced on the farmer under guarantee of analyses full of chemical jargon, with an imposing array of figures to the second place of decimals, which tend to conceal rather than to disclose what is their true character.

Considerable latitude must no doubt be given to chemists in their methods of analysis, and also in their methods of stating their results; but as there are only a few things in a compound that are of value to a farmer, and whose amount he wants to know, it may reasonably be required of chemists that they should single out these constituents, and express them in a way which farmers can understand. The method of stating analysis adopted by the Society, and recommended

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for the use of its members, is to be found among the regulations of the chemical department.* By this method the constituents of a manure or feeding stuff that are of practical value are put separate from the body of the analysis, and expressed in the manner which is best understood by farmers and manufacturers. What is meant by a *sufficient guarantee* is an analysis expressed in that manner.

As examples of what analytical guarantees ought not to be, one or two of the guarantees supplied last year to members of analytical associations may be quoted.

A sample of bone meal supplied to the Lanarkshire Association was found to contain:

Phosphate of lime	41.76 per cent.
Ammonia	4.68 per cent.

The guarantee was:

Phosphate of lime	44 to 53 per cent.
Ammonia	4.50 to 5.50 per cent.

The phosphate of lime is below the guaranteed minimum fully 2 per cent, but it is more than 11 per cent below the maximum. The seller is not bound to supply anything beyond the minimum, and one is naturally led to inquire what the use is of the maximum of 53 per cent if only 44 per cent is really guaranteed. It looks like a temptation to the buyer to try his luck. He is asked to pay for 44 per cent, with a chance of getting 53 per cent. He is asked to pay for 4.50 per cent of ammonia, with a chance of getting 5.50. The analysis shows how far these fine chances were from being attainable. If such a guarantee has any legitimate meaning, it ought to mean that if the bones were found to contain the minimum of 44 per cent phosphate, it would be because the nitrogenous matter mixed with them would be greater, and the ammonia would be 5.50 per cent. On the other hand, if the maximum phosphates were obtained, the ammonia might fall to 4.50 per cent, but the analysis shows that a compensatory fluctuation of that kind was in this case impossible, for the ammonia turned out just about the minimum, and the phosphates somewhat under it. It is difficult to see why bone meal, which is a riddled and well mixed manure, should be sold under any such fluctuating guarantee.

* The form of stating analyses of manures for the New York State Agricultural Society will be found in this volume, immediately after the extracts from the regulations of the Chemical Department of the Highland and Agricultural Society.

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A proper guarantee ought to state the minimum per centage only for nothing beyond that is really guaranteed.

To take another example — a sample of dissolved bones supplied to the same association was found to contain :

Phosphate of lime, dissolved	18.32 per cent.
Phosphate of lime, undissolved	8.88 per cent.
Ammonia	1.38 per cent.

It was guaranteed to contain :

Phosphate of lime, dissolved	20 to 25 per cent.
Phosphate of lime, undissolved	8 per cent.
Nitrogen equal to from 4 to 6 per cent sulphate of ammonia.	

Here the "soluble phosphate" falls below the minimum, and there is not even the feeble compensation of a corresponding increase in the insoluble phosphate, which one is entitled to expect in such a case. The nitrogen in the manure is expressed as equal to four to six per cent *sulphate of ammonia.* Why was it not expressed as *ammonia* according to the common practice? If it was because sulphate of ammonia was added to the manure, then why call it "dissolved bones?" The figure expressing the sulphate of ammonia is nearly four times as great as that of the ammonia which it contains, and farmers who may not know the exact difference between ammonia and sulphate of ammonia, are apt to be deceived by such a method of expression.

Another misleading form of guarantee is that in which several constituents are grouped together, chiefly under the name of the one that is most valuable, though probably present in the smallest amount. Thus, in a mixed manure sold to the Strathearn association, there is guaranteed eight per cent sulphate of ammonia and potash, but the analysis shows only 0.76 per cent ammonia and 3.78 potash. If these two constituents are converted into sulphates, the total amount is more than eight per cent; but from the manner in which the guarantee is given, it is evident that the purchaser would expect four or five times as much ammonia.

A guarantee which is quite a curiosity in its way is one supplied with an article called "Vitriolized Dissolved Bone Manure," but which turns out to be really a superphosphate. It is guaranteed to contain "about thirty per cent phosphates nearly all rendered soluble, besides salts of ammonia, chlorides and sulphates." The analysis shows ammonia to be present only to the extent of 0.1 per cent, viz.: one part in 1,000, and yet it is guaranteed to contain "salts of ammonia." Either the manufacturer must have forgotten to put the

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bone or the ammonia salts in, or the guarantee is a sham. The presence of chlorides and sulphates is also guaranteed; the former a useless and accidental constituent and the latter a constituent which must of necessity form more than half the weight of a manure with thirty per cent phosphate rendered soluble by sulphuric acid. It might be thought useless to guarantee such constituents, but it evidently has a use, for the manure was sold for more than double its value. The seller seems to have had his doubts regarding the efficacy of the manure, for attached to the guarantee is the shrewd remark: "This manure may be advantageously used with Peruvian guano." One might as reasonably advertise chaff as an excellent feeding material, with the recommendation that it should be given along with a liberal supply of oats and beans.

These are a few examples of insufficient guarantees, and it may be as well to state here in a sentence what a sufficient guarantee of a manure is. It is a written or printed statement, telling in precise figures what is the smallest amount of each of the really valuable constituents of a manure.

To return to the consideration of the table showing the number and kind of manures supplied to the associations in 1881 and 1882.*

Despite the decrease of one-tenth in the total number of manures, there is a large increase in the number of samples of bone meal. The high average quality of the purchases in 1881 may have contributed to that result, but no doubt the depressed condition of agriculture and the consequent diminution in the number of live stock, caused a corresponding scarcity of farm-yard manure, and, therefore, an increased use of bone meal as a preparation for the turnip crop was found necessary. The quality of bone meal in 1882 is 50.3 per cent phosphate and 4.3 per cent ammonia, a little below the numbers of the former year, which were 51 and 4.4 per cent respectively. The average price was £7 19*s.*, and the average value by the society's units for the year was £8 3*s.*

The number of samples of dissolved bones is less than before. The average quality is good, viz.: Twenty per cent phosphates dissolved, thirteen per cent undissolved and two and one-fourth per cent ammonia.

* This table is not reprinted because it is not of special interest in America. It shows that for twelve associations, 202 analyses were made in 1882, and 221 in 1881. Of these there were of bones, 45 in 1882, 33 in 1881; of dissolved bones, 59 in 1882, 65 in 1881; of superphosphates, 33 in 1882, 30 in 1881, and of Peruvian guano, 11 in 1882 and 14 in 1881. Of feeding stuffs, 15 samples were analysed in 1882 and 26 samples in 1881.

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This is the kind of analysis one would expect to find if the manures were pure dissolved bones, but an inspection of the analysis of the samples shows, as before, that about one-third of the manures sold under the name of dissolved bones could not have been produced by dissolving bones in sulphuric acid, and probably only a fraction of the whole were pure dissolved bones. The name "dissolved bones" has now become a general name for all manures more or less resembling dissolved bone in composition. They are, in fact, ammoniated superphosphates, and they may or may not contain some bone. It matters little to a farmer whether they do or do not, and as before remarked, the less bone one sees in them the better An ammoniated superphosphate is the manure of the future, no matter how it may be named. It is the most useful kind of manure for most purposes, containing, as it does, the ingredients which the farmer wants most — soluble and insoluble phosphates and ammonia. So long as the manure is well dissolved, it is of no importance to a farmer what its origin is, and the cheaper the sources from which its materials are obtained, and the lower the price at which it is sold, so much the better for him. The ease with which a manure having the composition of dissolved bones can be manufactured from cheaper materials, and the difficulty, we might say the impossibility, of determining by analysis or otherwise the genuineness of a sample of dissolved bones, take away from the manufacturer any inducement to make the genuine article. Further, when we consider that the imitation is probably quite as good from an agricultural point of view, it is evident that farmers would consult their own interest by ceasing to inquire into the purity of dissolved bones, and paying an increased price for the name of the thing when they have no means of knowing that they are being supplied with the reality. Some samples of dissolved bones contain potash salts, which are added to them by the manufacturer, so as to give them the character of a general manure. The average price at which dissolved bones were sold to the associations last year was seven pounds per ton, and the average value, according to the Society's units of valuation, was £6 3s. per ton, showing that an average of 17s. per ton has been paid in excess of value, and that mainly on account of the charm associated with the term "bones."

There is an increase in the number of superphosphates sold to the associations last year. One-third were first class, containing 30 per cent or upwards of dissolved phosphate; one-third were second class, containing between 25 and 30 per cent; and one-third contained less than 25 per cent dissolved phosphate. Dissolved phosphate, no matter

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from what source, is of equal value as a manure, and a farmer who buys superphosphates intelligently will buy the superphosphate that gives him the most dissolved phosphate for his money. By applying that test he will probably find that the superphosphate at the lowest price per ton is the dearest of all. This is proved very conclusively by the purchases made last year. The first class superphosphates were bought at an average price of £4 14s. per ton, and that is just their value by the Society's units; but the third class superphosphates were bought at an average price of £4 5s. per ton, while their average value was only £3 9s. per ton. The highest class superphosphates bought last year were thus the cheapest in the end; but when we consider the cost of the material from which these are made, the difficulty of manufacturing them and the care required in their subsequent handling, it is probable that a second class superphosphate is the one which can be bought most advantageously.

There is a diminution in the number of samples of Peruvian guano, owing no doubt to the scarcity and consequent dearness of that manure. Most of the samples fall somewhat below their guarantee in ammonia, and although the prices are high, yet they are not extortionate, except in one notable instance of a manure called Phospho-Peruvian guano, which was sold to the Orkney association at £3 per ton above its value. The quantity of Peruvian guano in the market this year is very small, and the price is so high as to make it impossible for farmers to use it with advantage, except to a limited extent for special purposes. It is probable that next year there will be an increased supply of that manure in the country, but it is unfortunately quite evident that in a year or two the supplies of Peruvian guano will be exhausted.

One marked feature of the returns for last year is the great decrease in the number of special manures. The severe terms in which it was found necessary to refer to the inferior composition and exorbitant price of many of these manures in last year's report has, no doubt, contributed to their diminished use amongst members of the associations. It is satisfactory to observe that a decided improvement is noticeable in the composition and price of the special manures bought last year. Nearly the half of these were bought at prices which might be considered fair and reasonable, whereas in the former year not one-quarter of the purchases deserved that character. It seems, however, that there are still some manure merchants who are slow to learn the lesson conveyed in the report of last year, and who persist in selling their special manures at prices which cannot fail to be disastrous

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to farmers who use them to any considerable extent. Nearly the half of these manures, bought through associations last year, were sold at prices more than £2 per ton above their fair value. No one who knows the difficulties and risks which manure manufacturers have to contend with would wish unduly to diminish their margin of profit, but when it is found that some manufacturers or merchants are wont to sell their mixtures at prices from twenty to sixty per cent beyond those which firms of reputation consider sufficiently remunerative, it is time that farmers were put upon their guard.*

It is under the heading of "special manures" that the greatest deficiencies and the most extravagant prices are to be found. There is a natural expectation that, because they are sold under special names, they must have a special value; but, as a rule, that is far from being the case. The true special manure is the manure which a farmer finds by experience to be most suited to his needs, and a little experience will teach him that the special manure he wants can be made from the commonest materials.

When a farmer requires a mixture to be made for his own special use, and when that mixture differs somewhat from the composition of the ordinary manures in the market, and when the quantity he requires is small, it stands to reason that it cannot be supplied on the same terms as ordinary manures requiring no special attention, or as mixtures ordered in large quantity, and on that account special manures are apt to compare unfavorably with the ordinary standard manures in the market. The trouble and expense incurred in their manufacture require that they should be sold at a relatively high price, but when this extra cost is taken account of it will be seen that the prices at which special manures are sold are usually far in excess of their value. Not unfrequently they cost half as much again as they are worth, and in some instances their price is more than double their fair value. It is well that farmers should be impressed with this fact, and that they should be made aware that they can effect a considerable saving by buying the materials they wish to have in their mixtures at the ordinary market prices, and mixing up the few tons they require at their own farms.

The number of purchases of feeding stuffs made through the associations last year was little more than half that of the year preceding. Owing to the mildness of the winter, the success of the turnip crop, and the general abundance of "keep" in the country, the demand for feeding stuffs in 1882 was comparatively small. Linseed cake, as

* Several paragraphs of less general interest are here omitted.

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usual, formed the bulk of the feeding stuffs purchased, and almost all the samples analyzed were of good quality.

The quality of linseed cakes and other feeding stuffs, if in good condition and wholesome, depends on the amounts they contain of three constituents, viz.: Albuminoid matter, oil and carbo-hydrates. By albuminoid matter is meant such substances as gluten of wheat, legumin and other vegetable compounds which resemble white of egg and dried flesh in their composition. They are popularly known under the name of "flesh-formers," while the oils and carbo-hydrates are known as "fat-formers" and "heat-producers." The term carbo-hydrates includes such substances as starch, sugar, gum and allied substances. The average composition of the linseed cakes analyzed for the associations last year was 27 per cent albuminoid matter, 10½ per cent oil, and 37 per cent carbo-hydrates. This does not include three samples of cake supplied to the Vale of Alford Association, which were of inferior quality. In these cakes the albuminoid matter averaged only 21 per cent, and in one of them that constituent was 7½ per cent below the guarantee.

The usual guarantee given with a feeding cake is that it is "pure," or that it is "genuine," and sometimes it is guaranteed as "pure and genuine." One would suppose that a guarantee of that kind ought to be sufficient, but it is well known to analysts that linseed cakes guaranteed "pure" may vary widely in their composition and feeding value.

The value of a feeding cake chiefly depends upon the amount of albuminoid matter it contains, and that is precisely the constituent which is most liable to fluctuation. Among the samples of linseed cake sold to associations during the last two years, and guaranteed pure, the amount of albuminoid matter ranged from sixteen to thirty per cent. There is an enormous difference in the feeding value of cakes whose composition ranges so widely, but we look in vain to find any corresponding variation in their price. The prices do vary considerably, but these variations bear no relation to the real value. In 1881 the best cakes were sold at a little over £9 per ton, and the worst ones at £10 per ton. Last year the discrepancy was even more marked; the best cakes were sold at a little over £8 per ton, and the poor cakes, already referred to, were sold at £10 per ton. It is quite evident that there is great need of reform in this matter, and in view of the direction in which our agriculture is tending, it is very important that an intelligent method of buying and an equitable system of valuing feeding stuffs should speedily prevail. While it is no doubt

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true that the best test of a feeding stuff is the practical test, and that a stuff which has apparently the composition of a good feeding material may be unpalatable or difficultly digestible, or may contain within it substances which are innutritious or even positively injurious, yet it is equally true that when none of these disqualifications exist, but when the materials are good and wholesome, the value of a feeding stuff depends upon the amount which it contains of the three valuable constituents above referred to, and that is a matter which can be discovered by ordinary chemical analysis. That being the case, it is evident that feeding stuffs should be purchased on the basis of analysis, and seeing that the words "pure" and "genuine" are frequently applied to cakes of inferior feeding quality, a sufficient guarantee of a feeding stuff ought also to state the percentages of albuminoid matter, oil and carbo-hydrates which it contains.

It is right that the guarantee "pure and genuine" should be obtained with feeding cakes, but it must be remembered that absolute purity is not to be found in these substances, and it is only when the impurities exist to a considerable extent that they cease to be considered pure in a commercial sense.

The relative values of these three constituents of a feeding stuff are not capable of a very strict numerical definition. Whether regarded from a feeding or from a commercial point of view, their relative values are liable to fluctuate considerably, according to varying conditions which need not be here enumerated or discussed. It will be sufficient for the present to accept, as regards linseed cakes, the relative values adopted for their valuation by most of the agricultural associations on the Continent, and to consider the albuminoid matter and the oil to be each about four times the value of the carbo-hydrates per unit, and the other two constituents as worth three shillings and nine pence each per unit,* and calculate the values of the linseed cakes analyzed for the associations last year; on that basis it will be found that the values obtained come very close to the market prices in most instances. The only purchases whose values vary considerably from their price are the three lots purchased by the Vale of Alford Association, at £10 per ton. Their value, according to their units, is from £8 to £8 10s. per ton.

There is very little difficulty in arriving at unit values by which to determine approximately the commercial value of linseed cakes, but

*Corresponding to eighty-two cents per unit per ton of 2,000 pounds, or about four cents per pound at twenty-four and one-half cents to the shilling.

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that cannot be said of other cakes and feeding stuffs, the supply of which is small, and whose quality and price are very variable.

In concluding this review, it is expedient that a few words should be said explanatory of the position which the Society has recently assumed towards its members and the members of analytical associations in the matter of the purchase of manures and feeding stuffs.

The purchase of these materials has become a necessity of modern farming, and the enormous amount of money expended on them has already been referred to. It has long been felt that in using them farmers are in the unfortunate position of not being sufficiently acquainted with their nature and value, and of having to rely in great measure on the knowledge and also on the integrity of those that supply them.

The experience of recent years has proved only too truly the need that exists of a great extension of that knowledge amongst farmers, and the care that requires to be exercised by them in order to secure themselves against the purchase of worthless or exorbitantly priced materials. The great development of the manure industry and the rapid changes that are occurring in the nature of the supply make it almost impossible for farmers to keep abreast of the progress of the times, and it has become of paramount importance that some sort of direction should be available for their guidance, and some control established for their protection. The Society has for many years endeavoured to supply the former of these wants in work of its Chemical Department, but until recently all measures of a protective kind were left to local enterprise. For the encouragement of local efforts in this direction, the scheme referred to in the former part of this report was inaugurated two years ago. A money grant in aid of the cost of analyses formed the basis of the scheme, but the conditions and regulations attached to the obtaining of the grant are such as to secure for the associations who accept them an immensely greater advantage than is expressed in the comparatively small amount of money which the grant contributes to their funds. The Society's regulations, if faithfully carried out, secure for the associations a uniform and efficient method of procedure, and what is still more important, it secures for them the powerful aid of the Society in the attainment of the end they have in view — the economical purchase of manures and feeding stuffs.

These latter advantages the Society also offers to all its members who choose to comply with its regulations.

An important part of the system of control now established is that

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which deals with the valuation of manures. The want of an authoritative and generally adopted system of valuing manures has long been felt. Various analytical associations have been accustomed to publish annually some method of valuation for the use of their members, but the methods adopted were not uniform, and the value ascribed to a manure varied considerably according to the method of valuation used. While some chemists declined to put a value on manures, rightly considering it to be no part of a chemist's business to do so, others were in the habit of affixing values according to methods of their own, which might or might not be openly explained. To put a stop as far as possible to these anomalies, as well as to enable it to carry out its own scheme, the Society now publishes annually a table of unit values, by the use of which the approximate commercial values may be calculated from the results of analysis. The framing of such a table is a matter of no ordinary difficulty. Owing to the variety and complexity of the manures now in use, and the ingenuity exercised in their manufacture, it is extremely difficult to devise a method of classification and valuation which shall do justice to all good, honestly made manures, prevent all spurious imitations from being included in that category, and be at the same time capable of being easily understood and applied. Such a system of valuation, if attained and generally adopted, would not only serve as a guide to farmers, but would also be directly advantageous to all manufacturers of genuine and high-class manures. The scheme of valuation issued this year endeavours to supply the requisites above referred to, and the Chemical Committee have to acknowledge the assistance which it received from the representatives of the manure manufacturers in adjusting some of its terms.

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COMMERCIAL FERTILIZERS, ETC.

Extracts from Instructions and memoranda relating to the Chemical Department of the Highland and Agricultural Society of Scotland, appended to the volume of the Transactions of the Society for 1883.

MANURES—THEIR COMPOSITION AND CHARACTERISTICS.

Nitrate of Soda. — The most valuable nitrogenous manure. Perfectly soluble and immediately available for the nourishment of the plant. Feebly retained by the soil. Rapidly goes down to the subsoil, and improves its texture. Benefits deeply-rooting plants. Increases leaf and straw more than grain.

Good samples contain 95 per cent. or upwards of pure nitrate of soda, equivalent to about 19 per cent. of ammonia.

Five parts of nitrate of soda equal 1 of ammonia.

Sulphate of Ammonia. — A more concentrated nitrogenous manure than the preceding, but not quite so valuable to the farmer. Perfectly soluble, but not so rapid in its action as nitrate of soda. It is somewhat firmly retained by the soil, and not so liable as nitrate of soda to be washed out by heavy rains. It is therefore more suitable than nitrate for wet districts. Increases leaf and straw more than grain. Applied to grass, it checks the growth of clover and leguminous plants.

Good samples contain 93 per cent. or more of pure sulphate of ammonia, equivalent to from 24 to 25 per cent. of ammonia.

About four parts of sulphate of ammonia equal 1 of ammonia.

Dried Blood. — A nitrogenous manure which differs from the above in being insoluble. It must be decomposed in the soil before it yields up its nitrogen to the plant, and this it does only slowly. The nitrogen is in the form of albumen, and is capable of yielding from 12 to 16 per cent. of ammonia.

Horn Dust. — An insoluble nitrogenous manure, capaple of yielding 16 to 18 per cent. of ammonia. When in the form of fine saw dust, it decomposes easily, and is a good nitrogenous manure even for cereals.

Horn, when in the form of chips, or coarse shavings, decomposes extremely slowly, and is not suitable for manure.

Shoddy or Wool Waste. — An insoluble nitrogenous material used by manure manufacturers as a source of ammonia in dissolved manures. It is capable of yielding from 5 to 10 per cent. of ammonia. but is unsuitable for direct application as a manure.

Leather. — A very insoluble nitrogenous material, yielding about 5 per cent. of ammonia, used by manure manufacturers, but possessing no interest for the farmer.

Peruvian Guano. — A general manure formed of the excrements of fish-eating birds, and containing nitrogenous compounds, phosphates and potash.

High-class Peruvian guano is rich in nitrogenous matter, a large proportion of which is soluble. As now imported it is capable of yielding from 8 to 12 per cent. of ammonia, part of which is derived from ammonia salts, and part (less than 1 per cent) from nitrates. Phosphates are low, seldom exceeding 30 per cent., but from one-quarter to one-half of the phosphates is soluble. The amount of potash is small, usually from 3 to 5 per cent.

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Low-class Peruvian guano, as now imported, is poor in nitrogenous matter, yielding only from 3 to 5 per cent. ammonia. The phosphates are correspondingly high, viz , from 30 to 50 per cent., but the proportion of soluble phosphate is much smaller than in high-class Peruvian guano. Potash occurs to a very small extent, viz., about 1 to 3 per cent.

Low-class guanos are formed from high-class guanos, by the washing out of soluble constituents by rain, etc., and their composition varies greatly according to the amount of washing they have undergone.

Genuine Peruvian guano frequently contains a large proportion of stony insoluble matter.

ICHABOE GUANO. — A general manure, but of recent formation. It is very rich in nitrogenous matter, which yields from 10 to 16 per cent. of ammonia, but a large part of the nitrogenous matter is in the form of feathers, which are insoluble and of low manurial value. The total phosphates vary from 18 to 30 per cent., of which from a fourth to a half is usually soluble. There is seldom more than 2 per cent. of potash present.

FISH GUANO. — Derived from fish-curing yards and consisting of the heads and offal of fish dried and ground. Properly speaking, it is not a guano. The name guano is properly applied only to the dung of birds.

High-class fish guano contains nitrogenous matter, yielding from 10 to 12 per cent. of ammonia, but it is in the form of insoluble albuminous compounds, which only very slowly decompose and become available as plant food. The phosphates range from 18 to 30 per cent., and are all insoluble.

Low-class fish guanos are substances like the preceding, but containing less nitrogenous matter and more phosphates. They are simply bone manures, with somewhat more ammonia and less phosphate than ordinary bone meal, and having no real resemblance to a guano.

Fish guanos are usually impregnated with fish oil, which detracts from the value of the manure. The oil varies from 3 to 10 per cent.

FRAY BENTOS GUANO. — The dried and ground residue and debris of animals after the extraction of "Liebig's Extract." It is not a guano. It contains nitrogenous matter and phosphates, both of which are insoluble and slow in their action as manures. It varies in composition, yielding from 5 to 12 per cent. ammonia, from 16 to 35 per cent. phosphates, and a small proportion of potash.

BONE MEAL. — Chiefly a phosphatic manure, but containing also nitrogenous matter. Phosphates range from 44 to 58 per cent., according to the purity of the bones, and are insoluble. The nitrogenous matter is capable of yielding from 4 to 5 per cent. of ammonia, and is also insoluble. There is usually 3 per cent. or more of oil in bones, and this retards its action as a manure. The finer ground it is the more speedy is its action.

BONE DUST. — A coarser ground bone than the preceding.

CRUSHED BONES. — Still coarser ground.

STEAMED BONE FLOUR. — Bones which have been subjected to steam at high pressure for the extraction of the glue or gelatine. The residue contains from 56 to 65 per cent. phosphates, and from 1 to 2 per cent. ammonia. It is white colored and friable, and can be crushed with the hand. It is able to be, and ought to be, ground to a fine flour. Owing to this latter character, it is the most active form of bone manure.

PURE DISSOLVED BONES. — Bones dissolved in sulphuric acid and dried with bone ash or bone char, or other bone material. It contains usually less than 20 per

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cent. soluble phosphate, about 10 per cent. or upwards of insoluble phosphate, and yields from 2¼ to 3¼ per cent. ammonia.

VITRIOLATED BONES. — Bones which have been moistened with sulphuric acid and thereafter allowed to heat in large heaps for a long time. Good samples contain from 6 to 12 per cent. soluble phosphate with from 30 to 40 per cent. insoluble phosphate, and yield from 3 to 4 per cent ammonia.

SUPERPHOSPHATES. — Phosphates dissolved with sulphuric acid. Their composition varies according to the richness of the phosphate from which they are made and the extent to which they have been dissolved.

High-class superphosphates are made from phosphates containing a high per centage of phosphate of lime, and are very thoroughly dissolved. They should contain between 30 and 40 per cent. soluble phosphate and very little insoluble phosphate.

Medium superphosphates contain at least 23 per cent. soluble phosphate, and all below that are low-class superphosphates, made from minerals poor in phosphate of lime, or insufficiently dissolved.

MINERAL PHOSPHATES exist in great variety, and contain very various proportions of phosphate of lime, viz., from 20 to 90 per cent. They are of use as manures only when they are ground to the finest flour. Even when ground very finely, some are so hard and insoluble as to be of no use as manures.

COMPOUND MANURES. — These are general manures containing nitrogenous matter, phosphates and potash, and their value depends not only on the amount of these constituents but also on their fineness of division, their solubility and the skill displayed in their manufacture.

The general character of a few of the more common of these may be indicated thus:

Turnip compounds. — These usually contain from 25 to 35 per cent. phosphates, of which the half or more is soluble, and nitrogenous matter, capable of yielding from 2 to 4 per cent. of ammonia, and sometimes 1 or 2 per cent of potash.

Potato compounds. — These are somewhat like the preceding, but contain usually less phosphate and a little more ammonia, from 3 to 6 per cent.; sometimes they contain no potash, but more frequently about 3 or 4 per cent. is present, and in some instances twice as much.

Bean compounds. — These may contain from 10 to 20 per cent. phosphates, nitrogenous matter yielding from 3 to 7 per cent. of ammonia, and usually a considerable proportion of potash, often as much as from 6 to 10 per cent.

Cereal compounds. — These usually contain about 20 per cent. phosphates, mostly soluble, and nitrogenous matter yielding from 3 to 6 per cent. ammonia, and seldom contain potash.

Grass compounds. — These are somewhat like the preceding, but may contain less phosphates and more nitrogen, part of which may be in the form of nitrate.

RELATIVE ACTIVITY OF MANURES.

Nitrogen. — Most active in — 1st, nitrates; 2nd, ammonia salts; 3rd, high-class Peruvian and Ichaboe guanos; 4th, high-class dissolved compounds; 5th, dried blood; 6th, steamed bone flour; 7th, fish guano and fine bone meal; 8th, rape cake and cotton cake dust; 9th, bone dust and crushed bones.

Phosphates. — Most active in — 1st, superphosphates and dissolved phosphates derived from any source; 2nd, precipitated and reverted phosphates; 3rd, steamed bone flour; 4th, bone ash; 5th, Charleston and similar phosphates ground to the finest flour; 6th, bone meal and fish guano; 7th, bone dust and crushed bones.

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HINTS ON THE APPLICATION OF MANURES.

NITROGENOUS MANURES.

Nitrate of Soda.— Apply as a top-dressing to the braird. Showery weather advantageous. Heavy rains cause loss. Two half doses with fortnight interval better than one whole dose. Increases straw more than grain.

Sulphate of Ammonia.— Apply as top-dressing after sowing, not after brairding. Increases grass, diminishes clover. More suitable than nitrate for wet districts.

High-class guanos.— Apply with the seed, or partly as top-dressing. Useful for young grass and early potatoes.

Dissolved compounds.— Apply with the seed.

Dried Blood.— Apply a month before sowing, if possible. If applied with the seed, useful for root crops only.

Fish Guano.— Best on warm, open land, and in moist climates. Apply as early as possible. Should not contain more than three per cent oil.

Leather and Shoddy.— Of no value to the farmer.

PHOSPHATIC MANURES.

Superphosphate.— Best phosphate for clayey soils. Suits medium soils. Makes early crops, therefore good for late districts. Increases grain more than straw.

Precipitated Phosphate.— Best on medium and light land.

Steamed Bone Flour.— Should be finely ground and applied early. Best on light soils or on moorland. Suits wet climates. Excellent improver of light pastures. Quicker than bone meal in its action.

Bone Ash.— Generally applicable. Best on light land.

Bone Meal.— Should be as fine as possible and applied early. Best on light free soils, and on sandy soils.

Mineral Phosphate.— Must be ground to the finest flour, and feel soft and chalky. Best on moorland and land rich in organic matter. Should be applied very early.

Bone-dust and Crushed Bones.— Suitable for vine borders.

PHOSPHATIC MANURES.—Applied alone, frequently fail to give a full crop. Some nitrogenous manure ought to be mixed with them.

POTASSIC MANURES.— Useful where potatoes or beans are grown, or where straw is sold. Increase clover. Seldom required where much dung is used. Sometimes injurious if applied with the seed. Should be applied very early.

LIME.— Best when coarsely ground, sown broadcast, and allowed to slake on the land. Better slaked in large heap, and then carted on and spread, than slaked in small heaps on land. Better two small limings than one big one. Best results on clay land and moorland. Liming *on the lea* prevents finger-and toe, but frequently fails to do so if applied to stubble.

NOTES REGARDING ANALYSES.

I. MANURES.

The three items of greatest importance in manures are phosphoric acid, nitrogen and potash.

1. PHOSPHORIC ACID is present in manures as such, and also as phosphates of lime, magnesia, iron, and alumina.

Phosphate of lime is most important, and exists in two states, insoluble and soluble.

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Insoluble:

Insoluble phosphate of lime, called also.....
Tricalcic phosphate and.....
Tribasic phosphate of lime..... } Contains about 46 per cent. phosphoric acid.

Soluble:

Soluble phosphate of lime, called also.....
Acid phosphate of lime, and erroneously.....
Monobasic phosphate of lime..... } Contains about 61 per cent. phosphoric acid.

Some analysts prefer to state the soluble phosphate as:

Biphosphate of lime, called also.....
Monobasic phosphate..... } Contain about 72 per cent. phosphoric acid.

The soluble phosphates are usually stated as equivalent to so much tri-calcic phosphate.

Soluble phosphate multiplied by 1½.....
Biphosphate multiplied by 1½..... } Gives the equivalent of tri-calcic phosphate nearly.

Much confusion has arisen from the various methods of stating soluble phosphates. To escape from this confusion it has now become the custom to consider the term "soluble phosphate" *to mean* "phosphate of lime rendered soluble." *In other words, soluble phosphate means its equivalent of tricalcic phosphate.*

Phosphate of magnesia occurs in small quantity in bones, etc., and is usually reckoned as tricalcic phosphate.

Phosphates of iron and alumina, when occurring in *small quantity*, are usually reckoned as tricalcic phosphate, but if the quantity is considerable, it should be separately estimated.

2. NITROGEN occurs in manures mostly in three forms — Ammonia salts, nitrates and albuminoid matter.

Ammonia sulphate (pure) contains 25¾ per cent. ammonia.

Ammonium chloride (pure) contains 31¾ per cent. ammonia.

Nitrate of soda (pure) contains 16.47 per cent. nitrogen, equal to 20 per cent. ammonia.

Albuminoid matter contains about 16 per cent. nitrogen, equal to about 19 per cent. ammonia, most of which sooner or later becomes available as plant food.

3. POTASH is found in small amount in most manures, and should be reckoned as anhydrous potash (K_2O)

Sulphate of potash (pure) contains potassium equivalent to 54 per cent. anhydrous potash,

Muriate of potash (pure) contains potassium equivalent to fully 63 per cent. anhydrous potash.

II. FEEDING STUFFS.

These are chiefly concentrated forms of food whose value depends on the amounts they contain of albuminoids, oil and carbo-hydrates.

Albuminoids are compounds containing nitrogen, and more or less resemble dry flesh in their composition. They are sometimes called *flesh formers*. They are the most valuable constituents of feeding stuffs. The percentage of nitrogen contained in a cake multiplied by 6¼ gives the percentage of albuminoids.

Carbo-hydrates are compounds such as sugar, starch, gum and cellulose. These are sometimes called *heat producers*.

Woody fibre is the name given to that part of the cellulose which is insoluble when boiled in weak solutions (5 per cent.) of acids and alkalies, and is therefore considered indigestible.

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Good linseed, cotton and rape cakes, should contain from 4 to 5 per cent. nitrogen, about 10 per cent oil, and about 6 per cent. ash.

USEFUL FACTORS.

AMOUNT OF	Multiplied by	Gives corresponding amount of
Nitrogen	1.214	Ammonia.
Nitrogen	6.3	Albuminoid matter.
Ammonia	3.882	Sulphate of ammonia.
Ammonia	3.147	Muriate of ammonia.
Ammonia	3.706	Nitric acid.
Ammonia	5.0	Nitrate of soda.
Potash, anhydrous	1.85	Sulphate of potash.
Potash, anhydrous	1.585	Muriate of potash.
Phosphoric acid (anhydrous).	2.183	Phosphate of lime.*
Phosphoric acid (anhydrous).	1.4	Bi-phosphate.
Phosphoric acid (anhydrous).	1.648	Soluble phosphate (monocalcic tribasic).
Soluble phosphate †	1.325	Phosphate of lime.
Bi-phosphate	1.566	Phosphate of lime.
Lime	1.845	Phosphate of lime.
Lime	1.786	Carbonate of lime.

* By phosphate of lime is meant tricalcic phosphate ($3\,CaO, P^2O^5$).

† Monocalcic tribasic phosphate ($CaO, 2\,H^2O, P^2O^5$).

FORM OF STATEMENT OF ANALYSES OF FERTILIZERS FOR THE NEW YORK STATE AGRICULTURAL SOCIETY, BY W. M. HABIRSHAW, F. C. S., CHEMIST TO THE SOCIETY:

Water at 100° C..... per cent.
Nitrogen as nitrates..... "
Nitrogen as ammonia salts..... "
Nitrogen, organic..... "
Phosphoric acid, soluble..... "
Phosphoric acid, reverted..... "
Phosphoric acid, insoluble..... "
Potash as sulphate..... "
Potash as chloride..... "

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TABLE

Showing the VALUE, *in cents and tenths of cents,* PER POUND, *in various classes of different* COMMERCIAL FERTILIZERS *of* PHOSPHORIC ACID (*distinguished as Available and Insoluble*), NITROGEN *and* POTASH, *according to the* SCALE OF VALUES *for determining the* COMMERCIAL VALUES *of Manures, on strictly cash prices, at Scottish sea-ports, bags not included, adopted by the* HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND, *for the year 1883, reckoning the shilling sterling as worth twenty-four and a half cents, U. S.*

CONSTITUENTS.	IN AMMONIACAL GUANOS, GENUINE AS IMPORTED.		IN FISH MANURES (INCLUDING SO-CALLED FISH GUANO).		IN DISSOLVED MANURES (INCLUDING DISSOLVED BONES AND OTHER COMPOUNDS).				IN SUPERPHOSPHATES.			IN STEAMED BONE FLOUR.		IN BONES, GROUND OR CRUSHED.			IN GROUND MINERAL PHOSPHATES.		In Sulphate of Ammonia.	In Nitrate of Soda.
	1st Class.	2d Class.	1st Class.	2d Class.	1st Class.	2d Class.	3d Class.	4th Class	1st Class.	2d Class.	3d Class.	1st Class.	2d Class.	1st Class.	2d Class.	3d Class.	1st Class.	2d Class.		
Available Phosphoric Acid	8.4	8.4	.....	.....	8.4	8.4	8.4	8.4	7.2	6.6	6.6	....	....	....	....	....	.....	.....	....	.....
Insoluble Phosphoric Acid	6.0	5.4	6.0	5.4	4.8	4.2	3.6	3.0	4.2	3.6	3.0	6.0	5.4	5.4	5.2	4.8	4.4	3.6	....	.....
Nitrogen	26.0	24.7	22.7	21.3	24.0	22.7	21.3	17.3	....	....	....	22.7	22.7	21.3	20.0	18.7	.....	.....	22.7	17.3
Potash	6.0	6.0	....	.....	6.0	6.0	6.0	6.0	....	....	....	....	....	....	....	....	.....	.....	...	.....

NOTE. — The classification of manures in the above table is as follows:

AMMONIACAL GUANOS, genuine as imported. } *First class*, containing over six per cent of ammonia (equal to a little less than five per cent of nitrogen).
FISH MANURES (including so-called Fish Guano). { *Second class*, containing less than six per cent of ammonia.

DISSOLVED MANURES. — *First class*, the half of total phosphates dissolved, containing six per cent or over of ammonia, and not over two per cent of which will not pass through a one-fourth inch sieve.
Second class, less than half of total phosphates dissolved, containing three per cent or over of ammonia, and not more than four per cent of which will not pass through a one-fourth inch sieve.
Third class, containing not less than twenty-five per cent total phosphates, 1.75 per cent or over of ammonia, and not over eight per cent of which will not pass through a one-fourth inch sieve.
Fourth class, containing less than twenty-five per cent total phosphates, less than 1.75 per cent of ammonia, and less fine than third class.

SUPERPHOSPHATES. — *First class*, not less than sixteen per cent available phosphoric acid.
Second class, not less than 11.43 per cent available phosphoric acid.
Third class, less than 11.43 per cent available phosphoric acid.

STEAMED BONE FLOUR. — *First class*, containing not less than fifty-five per cent phosphates and one and a-half per cent of ammonia, and ninety per cent of which is in state of flour.
Second class, containing less phosphates, or less ammonia, or less finely ground than first class.

BONES. — *First class*, containing not less than fifty per cent phosphates and four per cent or over of ammonia, and ninety per cent passing through a one-eighth inch sieve.
Second class, same as *first class*, except that ninety per cent will pass through a one-fourth inch sieve.
Third class, in any respect inferior to *second class*.

GROUND MINERAL PHOSPHATES. — *First class*, eighty per cent passing through No. 80 wire cloth.
Second class, less fine than *first class*.

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PROCEEDINGS OF THE SOCIETY.

ANNUAL MEETING, 1878.

REPORT OF THE EXECUTIVE COMMITTEE.

With few exceptions, the crops of the year 1877 in the State of New York have been most abundant. All the cereal grains have given large yields, well ripened, and of excellent quality; the wheat crop of the western part of the State being worthy of the early days of the Genesee country, and the harvest in general furnishing an overwhelming argument against the theory, so strangely held against the unanswerable logic of facts, that our soil has become impoverished. True, it is no longer a virgin soil; it has come to the condition of a diminished but yet ample productive capacity, which, under our ordinary agricultural management, appears to be liable to no appreciable deterioration. That system of agriculture, in which the clover plant holds an important place, and in which judicious rotation and attention to the preservation of all fertilizing materials are fully recognized, seems to be capable of maintaining the fertility of our grain lands permanently, and though the yield must necessarily vary with the season, we believe that the average has become a very steady one, quite as likely to be increased by improvement in method, and by the judicious application of capital in permanent improvements, such as draining, and in the purchase of artificial fertilizers, as to be diminished by the exhaustion of the soil through repeated cropping.

In the dairy districts the product has been large, though somewhat reduced by drought in the northern counties. The important staple crop of potatoes was an excellent one, and the same may be said of the hop crop. In fact the partial failure of the apple orchards forms almost the only exception to the fruitfulness of the season.

With regard to the prices of farm produce, however, the showing is not quite so satisfactory. Wheat has done very well, but all other cereals have brought low prices, and potatoes, though better later in the season, were very low during the disposal of the bulk of the crop. Hops proved extremely unremunerative. Cheese has commanded a fair price during a greater part of the manufacturing season, but butter sold very low during the summer, and for only a moderate price in the autumn. It is to be considered, however, that if the income of the farm has been thus diminished, its expenditure has also been reduced, purchases being made, and labor employed at lower rates; that, moreover, the year has been one of economy, and the conclusion must be reached that the year closes very satisfactorily.

There is to be noted, in summing up the results of the season, the very general failure of the crop of clover seed in this State. The plants grew well and blossomed freely, but in a large, if not the largest, number of cases matured no seed. It is thought most probable that this quite serious misfortune is to be accounted for by the discovery of insects in the larva state, occupying the flower heads, and apparently feeding upon the partially grown seed vessels. There has not yet been opportunity to investigate the matter, or to identify the insect, but the subject will probably receive full attention during the coming summer.

The State fair, held at Rochester, was a successful exhibition in most of the

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classes of live stock; horses and sheep and swine being especially good. In farm produce, grain and vegetables made a good show, but there was a very small entry of cheese and butter. The display of implements was a very fine one, creditable to the manufacturers, and showing a most gratifying interest in the success of the Society. For the usually fine display of fruits and flowers, the Society is largely indebted to the coöperation of the Western New York Horticultural Society. But the show, especially in the cattle classes, should have been larger. The entry was much larger than the show, as quite a number of breeders, who had entered stock, were at the last moment decided not to send it, on account of having to pay, for carriage over the New York Central railroad, charges which they considered excessive. If the policy recently adopted by the managers of that railroad be persisted in, it will not only be unfortunate for the Society, but may, and indeed must, prove unprofitable to the railroad, because as soon as the extent of our exhibitions becomes diminished, the attendance, especially the attendance from a considerable distance, will diminish accordingly.

Owing to the unexpected and unavoidable absence during the greater part of the fair week of Professor David M. Greene, who has for some years been the able and efficient chairman of the judges of implements and machinery, it was found impracticable to award the prize for agricultural steam engines at that time. At the request of a number of exhibitors of such engines, the executive committee authorized the holding of a special trial, which was begun at Syracuse on Monday, November twelfth, and continued during the week, ten engines of nine different makes being tested. The place of trial, the spacious brass foundry rooms of the Bradley Manufacturing Company's works, admirably adapted to the purpose, was most kindly placed by the president of the company, Mr. C. C. Bradley, at the disposal of the committee, and Mr. Bradley, as well as the other managers, rendered in addition very valuable assistance in arranging for the trial, drawing for the purpose upon the ample resources of their extensive and admirably equipped establishment. The arrangements were planned by Prof. Greene, and thoroughly carried out by Mr. A. Avery Sweet, of Syracuse, and the tests were made by Prof. Greene and Mr. Henry Waterman, the consulting mechanical engineer of the Society, assisted by Mr. Sweet. These gentlemen had a toilsome week, testing each of eight engines during four hours of actual running, and two small engines two hours each. They have not quite completed their report, but it is certain that the trial was very satisfactory in the efficiency of the means employed, and that valuable results have been obtained. The powerful pump used as a measure of power, was kindly loaned by Messrs. Rumsey & Co., of Seneca Falls, and worked during the whole trial without a single stoppage due to the machine itself

The income of the Society for the year has just about equaled its expenses. The receipts of the fair were less than usually has been the case at Rochester, but a very considerable reduction was made in the expenses. There was in consequence a surplus from the quite moderate receipts applicable to the other expenses of the Society, and the result must, considering the times, be thought not unsatisfactory.

The financial position of the Society, however, is not such as to enable it to attempt the work it would gladly undertake. The large deficiency of the year 1876 was met partly by using the money received from the insurance upon the horse-stalls on the Elmira fair grounds, burned in that year, and partly by a subscription among the members of the Society, from which between $4,000 and $5,000 was realized; but this sum is to be repaid whenever the ability to do so shall exist, and the Elmira horse-stalls ought to be rebuilt.

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Such being the condition of the Society, application was made to the Legislature of 1877 for assistance, and both houses passed, with almost complete unanimity, a grant of $10,000, one-half of which was to applied to the restoration of the Elmira buildings. The appropriation, however, was disapproved by the Governor.

Texas cattle fever has appeared in at least one county of the State during the past year, but most happily the disease did not spread, the locality not being in the line of cattle traffic, and comparatively small loss resulted, though serious enough to the farmers concerned. The occurrence of the disease is, however, an important fact, because it shows that the enforcement of the traffic regulations of the Western States has become relaxed, and that they are no longer to be depended upon for our protection. We, therefore, again repeat the recommendation of legislative provision for protecting the State from invasion by contagious and infectious diseases affecting animals. Whenever Texas fever shall occur in any summer at Buffalo, Salamanca or Albany, infecting the cattle-yards and railroad cars, the supply of beef for New York city and Eastern cities, and for all our interior towns, will be at once cut off, and the consequences will be quite as disastrous to the urban as to the rural population of the State.

The committee records with deep regret, the death, since their last report, of Mr. S. S. Whitman, of Herkimer, and of Mr. John Shattuck, of Chenango, both old and esteemed members of the Society.

TREASURER'S REPORT.

Receipts.

Cash on hand at date of last report	$82 29
Sundry subscriptions	4,400 00
Net sales of tickets at Rochester	11,326 82
Refreshment privileges	1,074 00
Catalogues sold	59 50
Life membership fees	50 00
Annual membership fees	719 00
Cartage	84 90
Receipts of Secretary's office	2 50
Received on account of steam engine trial at Syracuse	162 17
State appropriation	1,706 25
	$19,667 43

Disbursements.

Expenses of previous years	$3,804 41
Salaries, etc	3,870 00
Incidentals, Secretary's office	92 75
Postages, etc	72 85
Library and museum	79 38
Elmira fair grounds	342 90
Expenses of annual fair (Rochester)	4,613 51
Premiums and premium expenses	6,093 94
Cash to balance in National Commercial Bank	697 69
	$19,667 43

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Officers for 1878.

President.— George W. Hoffman, of Chemung county.

Vice-Presidents.— First district, John D. Wing, of New York; Second district, Isaac H. Cocks, of Queens; Third district, I. Townsend Burden, of Rensselaer; Fourth district, N. Martin Curtis, of St. Lawrence; Fifth district, James Geddes, of Onondaga; Sixth district, Joseph Juliand, of Chenango; Seventh district, Robert J. Swan, of Seneca; Eighth district, Richard Church, of Allegany.

Corresponding Secretary.— Thomas L. Harison, of St. Lawrence.

Recording Secretary.—William H. Bogart, of Cayuga.

Treasurer.— Adin Thayer, of Rensselaer.

Executive Committee.—William M. Holmes, of Washington; George F. Mills, of Montgomery; William B. Dinsmore, of Dutchess; James W. Husted, of Westchester; Charles F. Wadsworth, of Livingston; Charles D. Dewey, of Monroe; Jesse Owen, of Chemung; Gerrit S. Miller, of Madison.

ANNUAL MEETING, 1879.

Report of the Executive Committee.

The year 1878 will probably long be remembered as a year of plenty, by the farmers of New York. All our staple crops, grain of all kinds, grass, both in meadows and pastures, and most of the special crops cultivated in this State, have been produced in abundance. The solitary but important exception is in the yield of potatoes, and even these have in some districts turned out very satisfactorily. It is also to be observed, that the same fruitfulness has extended over almost the whole of our country, and that the magnificence of the food-producing resources of the United States has never before been so grandly demonstrated.

In the midst, then, of the prevailing depression of values we can gratefully acknowledge that the only dearth that exists among us is that of money, and that the elements of material prosperity are abundantly present; while the large surplus of agricultural productions exported at prices which it is true are comparatively low, but are no longer estimated in a depreciated currency, is now largely contributing to bring the balance of our foreign trade in favor of this country.

The record of the Society's affairs during the past year embra ces few events of importance. The exhibition at Elmira was very full in all departments, and especially strong in the classes of live stock and farm produce. Of cattle, the show was the largest for many years, demanding a considerable addition to the number of stalls which had on former occasions been found sufficient. Of horses, the show was remarkably good, both as to number and quality. These two departments are more particularly noted, not only on account of their own interest and importance, but because in both of them, decided changes had been made in the schedule of prizes offered, the effect of which could only be known after actual trial.

The Society is under large obligations to the managers of the Erie and Pennsylvania railways for their wise liberality in again according the privilege of free transportation of property for exhibition, and not less so to the other railway companies, who on this occasion, as invariably in the past, granted the same essential aid.

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A great deal of interest was created by the competition for the special prizes, the money for which was given with equal liberality and good feeling by the Chemung County Agricultural Society.

Financially, the Society stands in much the same condition as at the last report. The receipts of the Elmira Fair were largely reduced by unfavorable weather, and were barely sufficient to cover premiums and expenses. The aid granted to the Society by the Legislature has, however, enabled it to rebuild the stables which were burned at Elmira, and to put the other buildings in a state of thorough repair. The interest upon the Society's debt has been paid, and there is in the treasury a considerable sum towards defraying the expenses of the year to come.

Two events of the year are of sufficient importance to the Society and to the farmers of this State to be noticed here:

The Legislature, at the last session, enacted a law in relation to commercial fertilizers, by which it is provided that none shall be sold in this State without a certificate of the percentages contained in them of each of the fertilizing agents which science and experience have both shown to be the chief constituents of value. Although we hold that in the purchase of fertilizers, as in all other affairs of life, intelligence is the best protection, the law now referred to may have a very useful effect, not only in preventing attempts to defraud (in which respect it serves the honest manufacturer and dealer no less than the farmer), but also in enforcing upon the public mind the fact that the money value of a fertilizer is absolutely and certainly to be ascertained by chemical analysis, and in that way only. Whether it may be profitable to buy these fertilizers at fair prices, and to apply them to the soil, is a question to be decided on each farm, or in each district, by actual experiment, and in America, as in Europe, the intelligent and prudent farmer will make no considerable purchase of fertilizers except upon a guarantee of the analysis.

It may properly be mentioned in this connection that the chemist of this Society, Mr. Habirshaw, of New York, stands ready now, as he has ever since his acceptance of that position, to analyze without charge all samples of fertilizers sent to the Society's office at Albany through the secretary of any town or agricultural society or farmers' club in the State; and it is suggested that wherever commercial fertilizers are used in any quantity, the farmers' clubs in the district can render no more practical benefit to their members than by enabling them to combine in purchasing in quantity, and always upon a guarantee of the analysis which may then be verified, through the agency of the State Society, without any cost excepting for express charges upon the samples.

The Legislature of 1878 also enacted a law in relation to infectious and contagious diseases of animals, and the people of the whole State, city and country, are to be congratulated upon having at last in a measure attained the protection so long and earnestly demanded by the Society. The action is the more opportune in view of the fact that the export of beeves and sheep alive, for sale in Great Britain, seems to have attained importance as a permanent outlet for a portion of our surplus, and to promise continued enlargement. It is difficult to estimate at present the benefit resulting from this trade, because the price of meat in our seaboard cities is now, notwithstanding the exports, as low as in the very cheap time of the corresponding date in the year 1861, and less than at the same date in the years 1859 and 1860. How much lower prices would have been, had we not acquired this new market, is of course merely a matter of conjecture. In view of the extent to which the trade has already been developed, and of the eminently wise legislation of Great Britain for the protection of the flocks and herds of that coun-

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try against the importation of disease, it is manifestly important that we keep our country free from any taint, and to this end it may not only be prudent but necessary to devolve additional powers and duties upon the boards of health of our cities, and, as a sanitary measure regarding the health of our own people, all cattle markets should be subject to inspection, one important object of which should be to prevent the slaughter and sale of animals which, either because they have not been allowed time to recover from the effects of long transit by railway, or in consequence of disease or injuries contracted or incurred, are not in fit condition to be used for human food.

The reports of the county and other agricultural societies, so far as received, show general prosperity, with exhibitions more than usually successful, in both extent and attendance. There has been held in the city of New York the first of a proposed succession of annual exhibitions of dairy produce, cattle and implements. It met with a very gratifying success, and promises to be a source of practical benefit to the dairy interest. Much credit is due to the public spirited projectors and conductors of this enterprise.

The executive committee records the deaths, on the twenty-second of May, of Joel B. Nott, at the age of eighty, at his residence near Albany; and, on the eighteenth of July, in his ninety-second year, of the Hon. Wm. T. McCoun, of Queens county. Mr. Nott was president of the Society in 1841, and was a gentleman of varied attainments and amiable character. Vice-Chancellor McCoun was president of the Society in 1858, and was not only an eminent jurist, but a most estimable country gentleman.

Treasurer's Report.

Receipts.

Cash on hand at date of last report	$697 79
O. H. P. Cornell, subscription	200 00
Proceeds of note discounted	982 11
Proceeds of note discounted	1,472 87
Sale of tickets, Elmira Fair	12,023 82
Refreshment privileges	697 50
Catalogues sold	145 18
Annual membership fees	695 00
Forage sold	102 21
Police justice, fines, etc	72 84
Life members	110 00
Sundries, secretary's office	48 00
Special premiums from Chemung county	225 00
Cash from State on account of premiums	7,142 80
State appropriation	1,706 25
	$26,321 27

Disbursements.

Expenses of winter meeting	$13 50
Expenses of previous years	1,422 87
Salaries and traveling expenses	2,986 25
Incidental expenses of office	62 65
Postage, etc	41 47
Library and museum	69 74

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Construction and maintenance of Elmira fair grounds	4,798 69
Expenses annual fair, Elmira	5,278 40
Premiums and premium expenses	7,413 27
Notes paid, discounted as above	2,500 00
Balance carried to new account	1,784 42
	$26,321 27

OFFICERS FOR 1879.

President.—Horatio Seymour, of Oneida county.

Vice-Presidents.—First district, John D. Wing, of New York; Second district, Isaac H. Cocks, of Queens; Third district, Joseph Hilton, of Albany; Fourth district, George F. Mills, of Montgomery; Fifth district, James Geddes, of Onondaga; Sixth district, Joseph Juliand, of Chenango; Seventh district, Robert J. Swan, of Seneca; Eighth district, Richard Church, of Allegany.

Corresponding Secretary.—Thomas L. Harison, of St. Lawrence.

Recording Secretary.—William H. Bogart, of Cayuga.

Treasurer.—Adin Thayer, of Rensselaer.

Executive Committee.—William M. Holmes, of Washington; James W. Husted, of Westchester; Jesse Owen, of Chemung; D. D. S. Brown, of Monroe; Samuel L. Hoxie, of Otsego; I. V. H. Scoville, of Oneida; George Tweddle, of Albany; James W. Wadsworth, of Livingston.

ANNUAL MEETING, 1880.

REPORT OF THE EXECUTIVE COMMITTEE.

The season of 1879 was in most parts of the State of New York favorable to the production of the staple crops, and in general large returns are reported. The yield of wheat in some of the central and southern central counties was somewhat diminished by drought and by the injury done by the Hessian fly, and drought reduced also the products of meadows and pastures. With similar exceptions the yield of orchards has been very large, and all parts of the State report a very large crop of potatoes, though, as usual in years of large crops, there has been some disease.

The hop crop was moderate in quantity, but from the price obtained for it, one of the most profitable in many years. Remunerative prices have also been obtained for grain of all kinds, and in the latter part of the season for the products of the dairy. Upon the whole, the year just closed is to be recorded as one of abundance, and as having brought to the agriculture of New York in some measure a return of prosperity, with fresh hopes for a fuller return yet to come.

Within a few weeks after the Society's annual meeting, the action of the British government in prohibiting the importation of live cattle from the United States on account of the existence of pleuro-pneumonia (the contagious lung-plague of cattle) in this country, called public attention to the subject, and rendered action for its suppression necessary. The fact that this disease had been imported in 1843, and had never since entirely disappeared, was known to those who had paid attention to the matter, but as it had been confined to a very small area, comparatively, and as the course of our cattle traffic is such that there had at no time appeared to be any serious danger of its spreading widely, its existence within our borders had

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hitherto excited but little apprehension, and in some quarters was even forgotten or denied. It was exceedingly fortunate that we were compelled to take action in regard to this disease just at the time when, as investigation showed, it was beginning to threaten to extend to the dairy and grazing districts — once introduced into which its progress westward would have been far more difficult to arrest.

Upon the facts being represented to him, and after the necessity for action had been shown by investigation, the governor took prompt measures, under the law passed in 1878 in relation to infectious and contagious diseases of animals. The Legislature at once made an appropriation to defray the expense, and the task of suppressing the disease was entered upon immediately with vigor, and has been prosecuted during the year efficiently, economically and with success.

At the present time the condition of the matter is as follows: The New England States are free from the disease, New York is clear with the exception of the suburbs of Brooklyn and of one dairy herd under quarantine in Putnam county, six in Westchester and five in New York, and the prospect is that in a few months, if the work is vigorously pressed, there will be left only the duty of guarding against infection from outside our territory. In New Jersey and Pennsylvania laws similar to that in force in our State have been enacted, and progress has been made toward extirpating the disease. In Maryland and Virginia and in the District of Columbia it is not known that anything has yet been done.

The following resolutions expressing the views of the executive committee upon the subject were adopted at a meeting held May 2nd:

Resolved, That while this committee is well aware of the fact that there is reasonable doubt whether the disease of neat cattle which exists, or has existed, in some milk dairies in Kings county, and in other counties of this State, and which has been pronounced by high veterinary authority to be identical with the contagious pleuro-pneumonia of Europe, is really that very contagious and destructive disease, and of the same virulent character and form as that in which it prevails now in Europe, and in which it appeared on the only occasion of its serious prevalence in the United States, in Massachusetts in the years 1859 and 1860, this committee nevertheless considers that the action of the State authorities in putting in force the law of 1878 for the suppression of this disease has been wise and proper; not only because the disease, whether its identity be or be not established, causes such an amount of loss to the milkmen who supply the cities of New York and Brooklyn, and so endangers the health of the inhabitants of those cities, by adding to the risk of their being supplied with unwholesome milk, that its suppression is a matter of public importance, but because, until it shall be suppressed, and while it is held by the veterinary advisers of the government of Great Britain to be the disease known to them as contagious pleuro-pneumonia, it constitutes an obstacle to the re-establishment of our trade with that country in live cattle and other stock, an obstacle which the State of New York, and other States in which the disease is reported to exist, ought to remove, in deference to the interests of all the States which are benefited by this trade.

Resolved, That this committee respectfully thanks the governor and Legislature for their prompt action in taking measures to control and suppress the disease in question, in amending the act of 1878 so as to make its provisions more effectual and its administration more economical, and in supplying the money so far required.

Resolved, That since the disease in question is reported to exist, or to be occasionally found in the States of New Jersey, Pennsylvania, Maryland and Virginia,

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in the neighborhood of the large cities of those States, and in the neighborhood of Washington, though not extending into the country, or, as yet, found at any place far from the sea-board, it is the opinion of this committee that the suppression of the disease can only be accomplished by the concerted and harmonious action of the authorities and legislatures of all the States so far involved, and that if such concert of action cannot be promptly secured, the importance of the subject and the emergency of the occasion are such as to excuse, if not to justify us, notwithstanding the State of New York has both the will and the power to execute the work within her own boundaries, in asking the action of Congress and of the general government to bring about the result desired.

Resolved, That a sub-committee, of which he shall be chairman, be appointed by the president of the Society for the full consideration of this subject, that this committee be instructed to present the views in the foregoing resolutions set forth, to the executive authorities and to the legislatures of the several States concerned, and to the Congress and to the President of the United States, and to take such steps as may seem expedient to promote the object of relieving this country from even the suspicion of harboring infectious or contagious diseases.

It is to be remarked, however, that while now, as heretofore, a very large proportion of the people of the State are uninformed as to the existence and character of the disease and of the impending danger which its gradual but, if unrestrained, steadily accelerating, spread surely implies, there can no longer, in the light of the facts ascertained during the past year, be any reasonable doubt of its identity with the lung-plague of Europe, or as to its being just as contagious and just as virulent here as in the countries in which it was first studied and described.

The chemist of the Society has made eighteen analyses of fertilizers during the year, under the offer to do the work gratuitously whenever requested through the secretary of any agricultural association in the State. Of these, eight were made for the Skaneateles Farmers' Club, one for the Ontario County Agricultural Society, and nine for the Franklinville Grange in Suffolk county. He has also in hand analyses of brewers' grains, and of starch factory refuse, in the course of which several doubtful or unsettled scientific questions have arisen, and which he holds until these questions can be satisfactorily determined.

The Society held the thirty-ninth annual cattle show and fair at Utica, beginning on the eighth of September.

The executive committee at the meeting held May 2nd, concluded an arrangement with the Utica Park Association for the occupation of the grounds owned by that corporation, whose officers at once proceeded to erect the necessary buildings, and to prepare the grounds for the Society's accommodation. The provision made was satisfactory, and the grounds were found to be well adapted to the purpose, though not so accessible as might be wished. The Utica park can be made in time one of the most pleasant places in the State for the State fairs, notwithstanding the difficulty or impossibility of compact arrangement, which exists wherever the grounds have a full mile race course. The show was a good one, especially as regards live stock, the display of cattle, in particular, being one of the largest and best ever made by the Society. The attendance of visitors was much less than was expected, and the receipts fell short of the amount required to pay the expenses and the premiums. The executive committee are glad, however, that by the public spirit and liberality of its citizens, the Society has been enabled to revisit Utica, one of the earliest of our cities to give a welcome to the Society, and from which we had

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at a former period what might almost be called a standing invitation, and invariably a cordial reception.

The executive committee record with deep regret the removal by death, during the past year, of several valued members of the Society. Mr. Joseph N. Sturtevant, of Massachusetts, died on the 19th of January, at an early age, but having already done much useful work in the cause of agriculture. The Hon. Goldsmith Dennison, of Orange county, died on the 15th of February, at the age of 78. Mr. Dennison was prominent for many years in the Society, and contributed to the Transactions the survey of his county and a valuable report upon the culture of the grape in our State. Dr. E. Ware Sylvester, of Wayne county, died on the 29th of March. Dr. Sylvester was one of the best informed and most successful nurserymen of Western New York, and a constant attendant at our exhibitions as competitor or judge.

Dr. Asa Fitch, of Washington county, died on the eighth of April. Appointed entomologist of the Society twenty-five years ago, Dr. Fitch began the series of reports upon the injurious and beneficial insects of the State, which have been so useful to our farmers and gardeners, and by which the merits of the author, as a patient and accurate observer, have obtained a recognition no less in foreign countries than in our own.

Treasurer's Report.

Receipts.

Balance from last account	$1,784 43
Utica Fair, ticket sales	11,089 74
Utica Fair, refreshment privileges	1,317 25
Sales of catalogues	111 48
Police justice, fines	15 00
Annual memberships	553 50
Life memberships	40 00
Secretary's office	23 41
State Treasurer, on account of premiums	7,622 00
Annual State appropriation	1,706 25
Balance to new account	30 28
	$24,293 84

Disbursements.

Expenses of annual meeting	$76 28
Expenses of previous years	749 70
Salaries and traveling expenses	3,615 10
Incidental expenses of office	76 74
Postage, etc.	50 95
Library and museum	113 20
Elmira Fair Grounds	348 70
Expenses of Utica Fair	6,399 23
Premiums at Utica Fair	7,881 64
Debt and interest	4,981 80
	$24,293 84

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OFFICERS FOR 1880.

President.— N. Martin Curtis, of St. Lawrence county.

Vice-Presidents.— First district, John D. Wing, of New York; Second district, Isaac H. Cocks, of Queens; Third district, Joseph Hilton, of Albany; Fourth district, George F. Mills, of Montgomery; Fifth district, James Geddes, of Onondaga; Sixth district, Joseph Juliand, of Chenango; Seventh district, Robert J. Swan, of Seneca; Eighth district, Marcus H. Phillips, of Orleans.

Corresponding Secretary.— Thomas L. Harison, of St. Lawrence.

Recording Secretary.— William H. Bogart, of Cayuga.

Treasurer.— Adin Thayer, of Rensselaer.

Executive Committee.— Jesse Owen, of Chemung; D. D. S. Brown, of Monroe; Samuel L. Hoxie, of Otsego; J. V. H. Scoville, of Oneida; George Tweddle, of Albany; Gerrit S. Miller, of Madison; Jacob J. DeForest, of Schenectady; Davis Cossitt, of Onondaga.

ANNUAL MEETING, 1881.

REPORT OF THE EXECUTIVE COMMITTEE.

The year 1880 was one of average productiveness in our State. With the exception of fruit, no crop of all our staples may be said to have been specially abundant, and none, excepting that of hay, deficient. The season was of a more than usually uniform character throughout the State, reports from all parts being that the spring and early summer were favorable, but were succeeded by an early and persistent drought, owing to which the product of dairies was greatly diminished. The comparative lightness of the hay crop, caused chiefly by the character of the preceding winter is partly compensated by its remarkable good quality, and the dairy farmers have obtained good prices for their reduced product. The health of farm stock has been generally good, the exceptions being the epizootic influenza, which attacked our horses in the month of October, but in a milder form than when it last appeared, and a slight and easily controlled outbreak of Texas fever in Oswego county. Pleuro-pneumonia has been confined within the limits mentioned in the report last year. It is greatly to be regretted that the failure of the appropriation which was expected to be made for the continuance of the work of extirpating this disease begun and so effectively prosecuted in 1879, rendered it impossible to rid the State of it, as would have been done almost certainly during 1880 had there been funds to meet the expense.

The reports of the county societies, so far as received, indicate that they are generally in a prosperous condition. In many of these reports there appears an increased disposition to devote less time at their fairs and less money to horse-racing, and in several of them mention is made of the large increase in the use of commercial fertilizers.

The fortieth annual cattle show and fair of the Society, held at Albany, the thirteenth to the seventeenth of September, brought together a large and very fine collection of live stock of all kinds, and a good display in the other departments of the exhibition. In agricultural implements, the new and improved self-binding harvesters constituted the noteworthy advance of the year. The expenses of the fair were much increased by the large rent paid for the grounds and by the very

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considerable sum which it was found necessary to expend upon the buildings, as well as by the high price of the forage provided. The receipts were diminished by unfavorable weather, only one day (Thursday) passing without rain.

The chemist of the Society has made, during the year, eleven analyses of fertilizers, of which samples were sent in, in accordance with the conditions established by the executive committee.

The executive committee record with sorrow the death, on the twentieth of August last, of Mr. William Chamberlain, of New York, a life-member of the Society, and for some time a breeder and exhibitor of Silesian Merinos from the celebrated flock formed by his father at Red Hook, in Dutchess county.

Mr. John Johnson died at his residence in Geneva, on the twenty-fourth of November No man has done more than he to illustrate the capability of productiveness of the soil of our State, and by both precept and example to elevate the character of its agriculture.

The recent death (on the twenty-sixth of December), in England, of Mr. John Joseph Mechi, is one which brings regret to many in this country. The praiseworthy and persistent efforts of Mr. Mechi to convince farmers and land-owners that the product of the soil of England might be largely and profitably increased by the adoption of new methods, and by the judicious employment of capital, as well for the purchase of stock, feeding stuffs and fertilizers, as in permanent improvements, have borne fruit in many ways, and not least in awakening thought and provoking discussion. To his large hearted sympathy and earnest advocacy is due the organization of the Agricultural Benevolent Institution, now established, it is believed, upon a secure financial basis. Of the very numerous visitors at Tiptree Hall, none were more cordially received than those from the United States, and copies of all the writings of its owner were invariably sent by him to our Society.

TREASURER'S REPORT.

Receipts.

Tickets sold at Albany Fair	$15,812 00
Refreshment privileges	2,885 00
Subscriptions by citizens	1,116 75
Annual membership fees	511 00
Transportation account	190 98
Catalogues	78 81
Magistrates' fines	21 50
Refunded premiums	10 00
Sales of freight	10 00
Sales of straw	6 59
Sales of lumber and manure since fair	137 56
Life membership fees	160 00
Sundries, secretary's office	24 60
State, balance old appropriation for premiums	3,235 20
New appropriation	4,500 00
Annual appropriation	1,706 25
	$30,356 24

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Disbursements.

Balance from last account	$30 28
Expenses of annual meeting	28 90
Expenses of previous years	278 71
Salaries and traveling expenses	4,200 00
Incidentals in secretary's office	89 81
Postage stamps, etc.	56 00
Library and museum	77 05
Stationery, printing, etc.	214 17
Expenses of Elmira grounds	398 09
Expenses of annual fair, Albany, 1880	12,047 15
Premiums and premium expenses	8,839 56
Interest on note and discount on trade dollars	70 56
Balance carried to new account	4,026 46
	$30,356 24

OFFICERS FOR 1881.

President.—Robert J. Swan, of Seneca county.

Vice-Presidents.—First district, John D. Wing, of New York; Second district, Isaac H. Cocks, of Queens; Third district, Erastus Corning, of Albany; Fourth district, George F. Mills, of Montgomery; Fifth district, James Geddes, of Onondaga; Sixth district, Joseph Juliand, of Chenango; Seventh district, D. D. S. Brown, of Monroe; Eighth district, Marcus H. Phillips, of Orleans.

Corresponding Secretary.—Thomas L. Harison, of St. Lawrence.

Recording Secretary.—William H. Bogart, of Cayuga.

Treasurer.—Adin Thayer, of Rensselaer.

Executive Committee.—James W. Husted, of Westchester; J. V. H. Scoville, of Oneida; C. C B. Walker, of Steuben; P. H. Shaw, of Albany; Gerrit S. Miller, of Madison; Davis Cossitt, of Onondaga; W. M. White, of Livingston.

ANNUAL MEETING, 1882.

REPORT OF THE EXECUTIVE COMMITTEE.

The season of 1881 was a peculiar though upon the whole a profitable one. A cold and dry spring and seed time, though it afforded opportunity for thorough preparation of the land, caused much anxiety about both autumn and spring-sown crops, but the warm and genial weather, with copious rains, which followed, assured, throughout the whole State, a full crop of hay, more than usually rich growth of grass in pastures, a fair but not a full yield of fall wheat and rye, and a remarkably good crop of barley and oats. In July began the long and severe drouth, by which the year will be long remembered not only in this but in all the Northern and Western States of the Union. In New York it may be said in general terms to have begun about the middle of July. It continued, with slight mitigation, to the end of the growing season, causing a great deficiency in the crops of corn and potatoes, and a considerable shrinkage in the yield of dairies.

Against the loss occasioned by the drought, we have to offset circumstances

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which have been sufficiently influential to make the season a prosperous one to the farmers of our State. All kinds of farm produce have found a ready market at highly remunerative prices. Grain, of which the yield of wheat was little below the average, and of barley and oats decidedly above, has sold high. The price of potatoes has made up for the deficiency of the yield, and dairy produce, especially cheese, has brought uniformly good, even high, prices throughout the season. Other products not usually classed as staples, apples, of which the crop was a very small one, hops a fair, though not a full crop, of good quality, beans, etc., have commanded good prices. The only approach to failure has been in the fall crops of vegetables in Queens, Suffolk and Westchester counties, and though these counties have thus met a serious loss, we must, taking the State as a whole, thankfully acknowledge that we have received a full return for the labors of the year. In the words of one of the most experienced and judicious of the farmers of Central New York, "this has been the best season for farmers to make money that we have had for several years."

The committee present this summary of the season and its results with greater confidence because it is based, not solely upon their own experience and observation, but also upon returns received from all but three (and these not of average importance agriculturally) of the agricultural counties of this State, and from in all about two hundred and fifty correspondents. These returns came in reply to circulars of inquiry, sent out at the end of July and at the end of October, when the subjects to which they referred were still fresh, and the most accurate information could be given. These replies, as well as those received to a circular sent out early in May, inquiring into the condition of the crops at that time, have been condensed and tabulated, and published in the three bulletins sent to the members of the Society in the months of May, August and November. Thanks are due to all who have responded, generally promptly and carefully, to the inquiries addressed to them, and especially to those correspondents who have not only themselves complied with the request made through the secretary of the Society, but have taken the trouble to obtain returns from other parts of their respective counties, and for that purpose to induce others to join them in the work. In particular we desire to acknowledge the service rendered in this matter by Mr. Murray Benham, secretary of the Ontario County Agricultural Society, through whose kind coöperation a larger number of replies to the October circular were received from his county than from any other.

The injury to the first growth of grass in pastures last spring, caused by an insect not previously known as destructive of vegetation, and extending over a large area in the counties of Jefferson, St. Lawrence and Franklin, was of serious consequence while the operations of the larvæ continued, though of comparatively short duration. The insects soon disappeared, and the pastures quickly recovered. The subject has been quite thoroughly investigated by the State entomologist, who visited the localities affected and observed the insects while engaged in their destructive work, and has since studied their habits and transformations. His observations and conclusions have been communicated to the Society in a paper read at one of the evening meetings during the Elmira fair, and he considers that it is not very likely that the insect, the vagabond crambus (*Crambus vulgivagellus*, Clem.), will again appear under circumstances permitting any serious mischief. There are reports which encourage the hope that the insects which have for some years been at work upon the clover plant in our State, the clover-seed midge (*Cecidomyia leguminicola*, Lintn.), preventing the formation of the seed, and the

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clover root-borer (*Hylastes trifolii*, Muller), which kills the roots, will in future be less destructive.

Upon the subject of pleuro-pneumonia, or the lung plague in cattle, the committee have but one slight ray of encouragement to report, and this is that the people of the Western States, and the agricultural press, begin to show signs of awakening to a sense of its importance. Some of the western agricultural papers, and notably the National Live Stock Journal of Chicago, have done good service in urging the attention of their readers to the danger by which they are menaced. In our State, during the past year, the efforts of the authorities have been restricted to the task of keeping the infection from extending beyond the limits within which, at the end of the previous year, it had been circumscribed. Every year's experience strengthens the conviction that our country can never be rid of this pest until efficient action shall be taken by the general government. The forthcoming report of the commission appointed by the Secretary of the Treasury, under authority given by Congress last year, to investigate the subject, is anxiously expected.

One occurrence of anthrax fever in cattle has been brought to the attention of the committee during the past year, upon a farm in Rensselaer county. The herd of Mr. Gardner, consisting of sixteen animals, had been pasturing on a tract of marshy land upon which sudden deaths of cattle had occurred in former years. Mr. N. Vasey, M. R. C. V. S., residing at Troy, investigated the matter, under the direction of the committee, and reported that the disease began in two heifers which were in somewhat high condition, and was communicated to other animals by contagion. Before his arrival five animals had died. One which he found hopelessly ill was killed and examined. By his advice the herd was removed to high and dry ground, after which two other deaths occurred. We are informed that another outbreak of anthrax fever, in Columbia county, was reported to the State Board of Health.

Eleven analyses of fertilizers have been made during the year by the chemist of the society, the samples being sent in accordance with the published conditions. Of these samples two were German potash salts. The others were manufactured manures, comprising four of the class of the ammoniated superphosphates, and five of special potato manures, having potash as a principal constituent of value. The analyses show very great differences, some of the samples being worth their price, some very nearly so and one at least very much less. It has been a matter of some surprise to the committee that a larger number of farmers have not availed themselves of the Society's offer of free analyses of commercial fertilizers upon conditions so easy to comply with, especially when, as we cannot doubt, the use of them is so steadily increasing. The renewed thanks of the Society are due to Mr. Habirshaw for his services as chemist.

The forty-first annual cattle show and fair of the Society, held at Elmira, was the occasion of bringing together a show of live stock very large in the aggregate, and in some of the classes remarkable for the high average quality as well as in number. The number of stalls for cattle had been increased for the last previous show at Elmira, in 1878, and it was found necessary to make a further addition for this fair. In the Shorthorn class the number was not so large as usual, but animals of excellent quality were on exhibition. The Devon class was very strong in numbers and in quality, so much so as to divide with the Jerseys the chief honors of the show, the herd prize being taken by Mr. William H. Jones, of Pennsylvania, a new exhibitor, after a very spirited competition. The show of Herefords was made by

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Mr. Corning, of our own State, and Mr. Merryman, of Maryland. The Ayrshires were in smaller number than on several previous occasions, but the class was well filled and the competition close, the herd prize going to Allegany county. In the Holstein class there were fewer exhibitors than the apparent interest in the breed gave reason to expect. The show of Jerseys, however, was one of the largest and best ever made at the fairs of the Society, and a very good exhibition of Guernseys was made by Messrs. Ledyard, of Cazenovia, Shimer, of Pennsylvania, and others. Mr. Taber, of Putnam county, showed several specimens from his herd of Norfolk Red Polled cattle, which attracted much attention and were favorably mentioned by the judges.

Of horses there was a large number of animals, mostly of high merit, in the classes of Clydes and Percherons. Of the lighter class, thoroughbreds and their crosses, including all the families most esteemed in this country for road and carriage purposes, the display was very large and the opinion was generally expressed that it had never been surpassed in quality. The class of harness horses was not large, and with a few exceptions not equal to the average in quality. The new class for ponies included a few very good ones.

Of sheep there was a good show in the classes of Leicesters and Cotswolds, a small number of good South-Downs, a good show of Shropshires and Hampshires, and, as usual, an excellent display of Merinos. The different classes of pigs were moderately well filled, and the animals were mostly good specimens of the various breeds. In poultry the show was smaller in point of numbers than last year, owing to the season being unfavorable.

Regarding the other departments of the show, it may suffice to say that the display of implements were both extensive and interesting, the improvements in harvesters perhaps attracting the most attention. Of farm produce there was, as usually at Elmira, a large and interesting exhibition, the dairy department only being below the average. Of fruits and flowers there was a comparatively small display, owing to the protracted drought.

The receipts of the fair amounted to $15,321.77, against $13,736.55 in 1878, $15,961.34 in 1875, and $15,131.72 in 1872, showing the average of the receipts of the four fairs held at Elmira since the establishment of permanent fair grounds at that city to be $15,037.85.

The Society has been called upon during the year to mourn the loss of its venerable ex-president, the Hon. Theodore S. Faxton, of Oneida, who died on the thirtieth of November, in his eighty-seventh year. Mr. Faxton was president of the Society in 1856, having been a member of the executive committee in 1845, and vice-president in 1852, and his interest in the welfare of the Society lasted to the close of his long and honorable life.

The committee also record with deep regret the deaths, on the twenty-fifth of February, of Dr. Herman Wendell, of Albany county; on the eleventh of March, of Mr. Arthur L. Van Benthuysen, of Albany; on the nineteenth of October, of Mr. Charles Van Benthuysen, of the same city, and on the fifteenth of November, of Mr. John Merryman, of Maryland. Dr Wendell having previously been an active member of the Society and of the standing committee on fruit, became a member of the executive committee in 1850, and was vice-president for his district from 1857 to 1864. Though greatly interested and learned in pomology, he was hardly less devoted to the improvement of cattle, and imported a number of finely bred and useful Short-Horns. In the Messrs. Van Benthuysen, father and son, the Society has lost two old and valued friends. Mr. John Merryman was best known to the

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members of the Society in general as a breeder and exhibitor of Hereford cattle; but to some of us, especially in the times before the war, as one of the most hospitable and genial of country gentlemen.

TREASURER'S REPORT.

Receipts.

Balance from account of 1880	$4,0[illegible]6 46
Sales of tickets Elmira Fair	13,543 27
Refreshment privileges	1,0[illegible]3 50
Annual membership fees	529 00
Transportation account	137 86
Sales of catalogue	72 50
Magistrate's fines	41 50
Street railroad	42 00
Forage account	200 01
Life membership fees	160 00
State, balance of old appropriation for premiums	3,500 00
State, annual appropriation	1,706 25
	$25,052 35

Disbursements.

Expenses of annual meeting	$21 70
Premiums and expenses of previous years	473 32
Salaries and traveling expenses	4,032 95
Incidental expenses in Secretary's office	132 91
Postage stamps, etc.	112 16
Expenses of library and museum	62 70
Stationery, printing, etc	203 39
Insurance Elmira Fair Grounds	348 73
Expenses Annual Fair at Elmira	7,893 62
Premiums and premium expenses	8,839 10
Balance to new account	2,931 77
	$25,052 35

OFFICERS FOR 1882.

President. — John D. Wing, of New York.

Vice-Presidents. — First district, Richard M. Hoe, of New York; Second district, Isaac H. Cocks, of Queens; Third district, Erastus Corning, of Albany; Fourth district, George F. Mills, of Montgomery; Fifth district, James Geddes, of Onondaga; Sixth district, Joseph Juliand, of Chenango; Seventh district, D. D. S. Brown, of Monroe; Eighth district, Marcus H. Phillips, of Orleans.

Corresponding Secretary. — Thomas L. Harison, of St. Lawrence.

Recording Secretary. — William H. Bogart, of Cayuga.

Treasurer. — Adin Thayer, of Rensselaer.

Executive Committee. — Davis Cossitt, of Onondaga; Gerrit S. Miller, of Madison; C. C. B. Walker, of Steuben; W. M. White, of Livingston; Henry E. Alvord, of Orange; L. W. Ledyard, of Madison; James McCann, of Chemung; James W. Wadsworth, of Livingston.

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ADDRESS DELIVERED BEFORE THE NEW YORK STATE AGRICULTURAL SOCIETY.

At the Annual Meeting, January 18, 1882,
By Robert J. Swan, President.

Gentlemen of the New York State Agricultural Society.—I congratulate you on the prosperity that has attended the Society in the past year. And as citizens, I congratulate you on the general prosperity of the State, and especially that agriculture has returned to the vast number engaged in it a fair measure of reward for intelligent effort in all its fields throughout our broad domain. Our farms have not been devastated by fire as in some of our sister States. In certain localities the protracted drought of summer and autumn affected important crops injuriously, it is true, and in extreme cases there have been failures, yet the general yield has not been greatly reduced, and we have therefore abundant cause for thankfulness to the Providence whose beneficence has covered the land with plenty, and for our enjoyment continued the blessings of peace essential to the prosperity of all our people engaged in every useful industry.

I may be permitted to recall to your minds certain facts in the history of the New York State Agricultural Society, for the annual meeting suggests the review. Sixty-two years ago the idea of forming an agricultural society to represent what was then pre-eminently the great industry of the State was conceived, and a few farmers of honored memory began to formulate the plan. Their work progressed slowly, for the hindrances were great. There were no railroads to transport animals and farm products to the fairs, nor was it even expected that the whole territory of the State should be represented at any exhibition. The telegraph was yet in the womb of time, and there was no quick interchange of thought over distances traversed by the mails conveyed in coaches as the quickest means of transportation employed in that day. Organization had, therefore, to proceed by slow processes, and it is not surprising that years passed before the Society was incorporated under proper forms of law. This occurred in April, 1832. Jesse Buel, of revered memory, was then the editor of the Albany *Cultivator*, and gave to the new Society great personal service, besides the valuable aid of his paper. His useful labor was given without stint to the objects contemplated in the organization, until the day of his death in 1839. Such men, through their acts of unselfish devotion to the public good, establish just claim to the affectionate regard of their successors. He and his co-workers met difficulties with noble courage that vanquished opposing force and pressed bravely to the attainment of objects sought.

They were ridiculed as "enthusiasts," as "book farmers," no doubt, yet they put their impress upon the agriculture of the State and gave us an organization that has vast possibilities whose execution devolves upon present workers and those who are yet to accept the responsibilities. Even now, after all the work of our predecessors for the advancement of agriculture, with the State Society just ready to enter upon the last half of a century of existence, there are many farmers within its field who decry its labors and make boastful display of their ignorance in the childish assertion that they know how to plow and sow and reap, and with ludic-

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rous appreciation of their proficiency ask: "What more do we want?" Do they not see that advancement has been made; that superior methods and improved implements have added to the profits of farming? Is it too much to say that the developments of knowledge in the past fifty years have given agriculture new dignity and conferred lasting honors on the men whose thought has thus lightened a thousand tasks while increasing the rewards of labor?

What agencies have been employed to accomplish these beneficent ends? Primarily, enlightened thought of men whose zealous efforts to ameliorate the hardships of labor have made them efficient teachers. But we may well consider for a brief moment the channels through which thought has been directed so beneficently. There is no agency more potent in elevating our calling, none more fruitful in good results, than the agricultural press. All honor to Jesse Buel and Luther Tucker, whose labors live after them; teachers who pointed the way through which talent might be directed to the ennobling of a profession that lies at the very foundation of all useful industry. Hardly less honor is due to the agricultural press of to-day, with its blessings multiplied by the increasing intelligence of farmers who no longer sneer in complacent ignorance at the lessons disseminated by printer's ink. May the day be hastened when every farmer, no matter how poor in material possessions, shall have regular visits of at least one agricultural journal worthily conducted for his behoof by extending the field of thought and ascertained fact in the science of agriculture.

If I may be permitted an illustration of the power exerted by the press for the improvement of agriculture by a single writer, I will refer you to the work of the late John Johnston, a deep thinker, a discriminating student, an original investigator, and withal, a successful farmer, whose knowledge was proved by practice. The lessons of his long life, disseminated through the press, have been of inestimable value to agriculture, especially in revealing the great benefits that attend thorough draining of heavy soils. The press is the available medium for the spread of knowledge in every department of agriculture. It conveys to all who seek information whatever means of gain the most intelligent members of the profession have proved by practice, and it is, therefore, wise economy for all farmers to avail themselves of its aid to the fullest extent consistent with time and opportunities allowed. The so-called learned professions have their special journals and make wise use of them. The lawyer or physician who neglects to read the current literature of his profession falls behind in the race of progress; but more than either the farmer has need of continual study, and must obtain practical knowledge of truths revealed by thousands of his fellows constantly engaged in original research tending to his advantage. This gain can come in no other way so fully as by reading the journals devoted to his interests, thereby fitting the farmer for intelligent application of every useful lesson so presented.

Another means of improvement may be found in farmers' clubs. The great good to be derived from free association of farmers in their clubs is easy of attainment. There is not a township in the State where agriculture is a prominent interest that may not receive immeasurable benefit through a well-conducted farmers' club. The remark applies to districts where clubs are already organized, as well as to others that have not yet instituted such means of improvement, for the most useful associations of this character constantly open new fields of investigation, and every attainment is but the stepping stone to further knowledge.

Farmers' clubs, district and county agricultural societies, throughout the State, have been steadily encouraged by the State Agricultural Society, and it is gratify-

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ing to reflect that the parent institution has called into existence so many auxiliaries. I trust the work of establishing others may be deemed worthy of energetic efforts by members of this Society, for I am confident that by such labor we may advance the true interests of agriculture and develop intelligence in the numerous class that, unfortunately, has allowed the practical labors of the farm to usurp attention to the exclusion of important thought needed to give profitable direction to physical effort.

Never before have the young men of our farms had opportunities for education so full as now. The schools are given more of a practical character than in the past. The young man, ambitious to acquire education, may have unusual aid. Thanks to the late Ezra Cornell and his associates, whose munificence established a university with an agricultural course, there is opportunity for young farmers far beyond any means of education offered in former years. From our farms the agricultural class of Cornell University should be constantly recruited to the full limit of capacity. We may thus have, from the graduating classes of this institution of learning, teachers to extend the field of knowledge, and that useful blending of science and practice which shall give our farming distinction, and that broad intelligence which indicates special fitness in the citizen for positions of honor and trust in the government of a free people.

As a special aid to farmers who desire advancement in the science of agriculture, the State has authorized the establishment of an agricultural experiment station, and appropriated a sum of money adequate to the undertaking at the outset, with the implied understanding that continued support will be given commensurate with the need as shown in the practical work of the station. The duty of locating the field was assigned by law to gentlemen who had gained distinction in various branches of farming, and the task has been accomplished. These gentlemen have also the responsible duty of directing the affairs of the station through an officer of their selection, to whom the immediate charge of the work contemplated is to be committed. They have been fortunate in securing the service of an eminent teacher, whose original investigations have already broadened the field of agricultural science and marked him as a leader in the search for useful knowledge calculated to simplify the tasks and reward the labors of practical agriculture. For the great work now past inception, and soon to appear in tangible products, I bespeak your earnest, full and thoughtful consideration, for its fruits must depend, in great measure, on co-operative effort, especially by intelligent farmers who seek advancement for their useful labor, and gladly avail themselves of the means revealed by intelligent research.

The desideratum is broader, fuller knowledge for farmers in every department of affairs affecting the products of labor or the rights and privileges of citizens. It is not enough to know how to manage the soil to secure its greatest yield. The products of labor may be so depreciated in the markets by unfair means as to deprive producers of their full reward. The tendency of the times is to make fictitious rates for our wheat, and corn, and cattle, and wool, thereby creating margins for speculators, whose interference in the market never adds one cent of value. Farmers in many portions of the State lose enormously by discriminations in transportation charges, whereby distant competitors are given artificial advantages that neutralize the best efforts of those who, by virtue of proximity to the markets, should have superior consideration in the prices of products at their homes. It rests with us to say how long these disabilities shall exist. Correction can be made when farmers have full and clear understanding of the evil practices and resolve that equal and exact justice shall be the rule — when they are prepared

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to insist that equality of rights shall be accorded to them as their inalienable privilege that cannot be subjected to encroachments without endangering the material prosperity of the Commonwealth clearly dependent upon their labor. Events have shown that the profits of agriculture depend upon conditions imposed by a few managers of transportation lines, even more than upon fertility of the soil and intelligent application of labor. Under present conditions it is clearly possible for our best farms to be reduced largely in commercial value by depreciating their products through discriminating rates. Thus with every care to maintain fertility, and to produce crops at the lowest rate of cost, there is imminent danger that skill and earnest application may not avail to maintain values in large part created by our labor. It is not my province to point out specific means of securing to agriculture immunity from the threatening danger. I trust the intelligence of farmers will be equal to the emergency, and that we shall soon see an adjustment of interests whereby every service entering into the ultimate value of farm products shall have due apportionment of profit, for such fair distribution of rewards is essential to the continued prosperity of all the people, whether engaged in agriculture, or commerce, or any other useful industry.

In closing my official term I desire to convey to the officers and members of the New York State Agricultural Society sincere expression of thanks for the generous consideration accorded me as presiding officer during the year. The duties of the position I accepted with extreme reluctance, because, mindful of their importance and deeply sensible of the great honor, I feared that inadequate service would be the poor return; but the cordial support rendered by the officers and members of the Society has lightened every task, and the relations, pleasantly maintained, impress me with sentiments of warm regard for all who have labored with me to advance the true interests of the Society, honored by the long succession of names eminent in the annals of agriculture, whose labors, given without stint, have brought proud distinction to the New York State Agricultural Society. In conclusion, I invoke the blessings of peace, good will and happiness upon all who labor with earnest purpose to promote the welfare of the land through every useful industry.

ANNUAL MEETING, 1883.

REPORT OF THE EXECUTIVE COMMITTEE.

The year 1882 may well be regarded by the farmers of our State as one of plenty and prosperity, in both respects equal to its predecessor, though in neither was the distribution as uniform. The season opened cold and dry, and in the month of April it seemed impossible but that the crops of winter grain and of hay must prove very deficient. After the first of May, however, the abundant rains and moderate temperature favored both these important crops, and produced an abundant harvest. Under the same influences spring-sown grain gave a full average yield. The prices of wheat and barley have been so low, however, that the grain-growers are less fortunate than in recent years. The corn crop suffered in its early stages from the cool and rainy weather of May and June, but so far recovered in July and August as to produce almost as much as in 1881. Dairy produce, somewhat reduced by the drought of the late summer and autumn, excepting in the northern counties, has commanded very full prices, and this interest has seldom had a better year. The disappointments of the season have been the partial failure of the potato crop,

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and the remarkable failure — total in some parts of the best fruit districts — of the apple crop. To hop growers the year has been a phenomenal one. The crop, though of good average quality, fell short from a third to even a half in weight, but owing to the failure of the crop in England and on the continent of Europe, it has commanded prices much higher than have been paid at any time during thirty years, if ever before, so that the proceeds have been, in the aggregate, enormous. It is to be wished that the good fortune thus showered upon the hop districts might not have the usual and almost inevitable effect of causing the business to be immediately overdone.

For a more full account of the season and crops reference is made to the three bulletins issued from the office of the Society in May, July and November. By the last of these it appears that a somewhat increased area has been sown with wheat, and that, notwithstanding late sowing and drought, it went into winter in good condition.

There was a good show of farm produce in the various classes, especially of dairy produce and of vegetables, and a well-arranged though not a large show of fruits and flowers.

The evening meetings were usually well attended, Mr. I. K. Felch, of Massachusetts, opening the first evening's discussion on poultry. On Wednesday evening the subject of ensilage and soiling was discussed by Mr. F. S. Peer, of Palmyra, and others, and on the last evening Dr. Sturtevant presented a paper on the culture of potatoes.

The receipts at the gates amounted to $15,605, as against $11,089.84 taken at the gates during the last previous meeting at Utica in 1879.

Forty-one analyses of fertilizers have been made during the year for the Society by its chemist, Mr. Habirshaw. The increased number, as compared with previous years, indicates a larger employment of commercial and manufactured manures in our State, and the results of the analyses, a tabulated statement of which is appended to this report, are in some respects deserving of study. Of the forty-one samples, three were Peruvian guanos, three salts of potash and of ammonia, and three were ground bone — all either natural substances or simple compounds which are to be regarded as ordinary articles of commerce rather than as manufactured manures. One was a sample of what are called Canada ashes, and three are simply nondescripts. One of them, a mixture called by a queer name, "farmers' promoter," sold for $37, and estimated, according to what appears to be a very fair schedule of values, to be worth less than $18 per ton; another sold under the name of rotted bone for $14, and worth by the same schedule $11.27; while as regards the third, called "guano substitute," sold for $46, the analysis gives insufficient data for estimating the value; but as it contains more than eight per cent of nitrogen and nearly ten per cent of phosphoric acid, it is probable that the price is not very excessive. Of the remaining twenty-eight samples, fifteen are properly superphosphates, with or without nitrogen (in no instance more than probably belonged to the bones of which they were made), and thirteen are called "special fertilizers." While aware that no schedule of values is to be relied upon as furnishing much more than a ready means of comparison, it may be noted that these samples being estimated by allowing Professor Johnson's prices of 1881 for nitrogen, twenty cents per pound or $4 per unit, and for potash four and one-half cents per pound or ninety cents per unit, and adopting the price of $2 per unit, for available phosphoric acid, because it plainly appears to have been obtainable at or under this price in Lister's acid phosphate, in the dissolved

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bone of the Farmers' Fertilizer Company, of Syracuse, and in Williams, Clark & Co.'s dissolved bone black, and for insoluble phosphoric acid the same price as for potash, because it costs nearly this price, but not quite, in Cooper's and in Baker's ground bone, it will be found that the simple superphosphates show much better than the so-called special fertilizers. Thus estimated, of the fifteen samples of superphosphates proper, in the case of four the valuation exceeds the price, and with the other eleven the price exceeds the value. The aggregated prices per ton of the fifteen amount to $542.50, the estimated values to $469.03, the prices being thus, on fifteen tons, $73.47, or fifteen and two-thirds per cent in excess of the estimated values. Of the four samples of which the estimated value exceeds the price, the excess is $12, or an average of $3 each. Of the eleven samples of which the estimated value is less than the price, the difference is $85.47, or an average of $7.77 per ton each. With regard to the special fertilizers, the case is worse. The thirteen samples aggregate in price $612, and estimated value $448.01, the price being 43.3 per cent higher on the average than the estimated value, and the average difference between price and estimated value $14.92 per ton. It seems to follow either that the schedule of values used is much lower than justice requires, or else that farmers are paying for these compounded fertilizers a good deal more than they are worth.

Of the three samples of Peruvian guano, No. 4 cost $68 per ton, and contains phosphoric acid, available and insoluble, and potash amounting, by the schedule used for the samples above considered, to $18.24. It contains also eight per cent. of nitrogen, costing by difference, $6 22 per unit, or over thirty-one cents per pound. No. 13 cost $34 per ton, and contains 7.53 per cent. of nitrogen, a total of 14.09 per cent of phosphoric acid, and 2.54 per cent. of potash. Estimating the phosphoric acid at nine cents per pound, or 1.80 per unit (which is Professor Johnson's price for 1881 for phosphoric acid in Peruvian guano), and the potash at ninety cents per unit, we have for these a valuation of $37.65, and there remains $36.35, or $4.79 per unit for the 7.58 per cent. of nitrogen. If No. 4 be estimated in this way, the phosphoric acid and potash together amount to $26.88, leaving $41.12, or a little over $5 per unit for the eight per cent. of nitrogen. In sample No. 30, described as guaranteed Peruvian guano, costing $54 per ton, there were found 5.51 per cent. of nitrogen, and 19.95 per cent. of phosphoric acid, of which 5.63 per cent. was available, and 14.32 per cent. insoluble. Computed by the first of the above methods, the nitrogen in this sample cost about $5.25 per unit. By the second method the cost is made only $3.10. These calculations show how little certainty can be attained in computing the value of manures, but taken together with the cost of nitrogen in sample No. 17 (sulphate of ammonia containing a little more than twenty per cent. of nitrogen and costing $100 per ton), they indicate a market value for nitrogen in manures of this character (guanos and salts of ammonia) of about $5 per unit.

The Society has lost during the year one of its ex-presidents, Benjamin N. Huntington, of Oneida, who died on the tenth of November, in the sixty-sixth year of his age. Mr. Huntington, who filled the office of president in 1860, was for many years largely interested in farming, and was most useful in the work of the Society while able to take a share in it.

By the death, on the twenty-sixth of October, of Mr. X. A. Willard, the agriculture of the State, and especially the dairy interest, has lost one of its most efficient workers. As a writer, a teacher and an organizer, he rendered services, to recount which it would be necessary to write the history of cheese making in America for more than twenty-five years.

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Mr. James Vick, of Rochester, died on the sixteenth of May, at the age of sixty-four. In him the Society loses a most useful member and steadfast friend. In the business which he established and successfully prosecuted, that of supplying seeds to all parts of the country through the post-office, he did much to promote the adornment of country homes. Mr Vick was a regular exhibitor for many years at the fairs of the Society, his display of cut flowers being usually the largest and most varied in the show, and he was a member of the executive committee in 1874 and 1875.

The committee also records with deep regreat the deaths of Mr. Carl Heyne, at his farm at Red Hook, on the thirteenth of March; of Mr. George P. Jackson, of Albany, on the second of July, and of Mr. Patrick H. Shaw, of Albany, on the twenty-second of November.

TREASURER'S REPORT.

Receipts.

Balance from account of 1882	$3,980 82
State, on account of premiums	4,911 45
Sales of tickets, Utica fair	15,604 99
Refreshment privileges	1,361 15
Annual members	528 50
Sales of catalogue	87 00
Fines	24 00
Life memberships	190 00
C. N. A. R. and H. Association, for water supply	500 00
State, annual appropriation	1,706 25
State, on account of premiums	3,058 55
	$30,991 71

Disbursements.

Expenses of annual meeting	$16 00
Expenses of previous years	515 29
Salaries and traveling expenses	4,080 76
Incidentals in secretary's office	80 84
Postage stamps, etc	126 80
Library	80 70
Stationery	188 72
Elmira fair grounds, insurance on buildings	873 86
Annual fair at Utica, 1882, including rent of ground and buildings	11,332 22
Premiums and premium expenses	8,839 01
Cash in bank	5,151 00
Cost of medals on hand, gold, 4; silver, 6; bronze, 20	270 31
Cash in secretary's office	86 70
	$30,991 71

OFFICERS FOR 1883.

President.—George F. Mills, of Montgomery.

Vice-Presidents.—First district, C. R. Agnew, of New York; Second district, Isaac H. Cocks, of Queens; Third district, Erastus Corning, of Albany; Fourth district, Timothy Hoyle, of Clinton; Fifth district, James Geddes, of Onondaga; Sixth dis-

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trict, Joseph Juliand, of Chenango; Seventh district, D. D. S. Brown, of Monroe; Eighth district, Marcus H. Phillips, of Orleans.

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Executive Committee.—Davis Cossitt, of Onondaga; Gerritt S Miller, of Madison; C. C B. Walker, of Steuben; W. M. White, of Livingston; Henry E. Alvord, of Orange; L. W. Ledyard, of Madison; James McCann, of Chemung; T. R. Proctor, of Oneida.

ADDRESS DELIVERED BEFORE THE NEW YORK STATE AGRICULTURAL SOCIETY.

At the Annual Meeting, January 17, 1883,

By JOHN D. WING, President.

It has been the custom of retiring presidents of this Society to make a short address giving a condensed report of the workings of the society for the past year, and some suggestions as to its future. It affords me particular pleasure to report the past year as having been one of the most successful in our history, and our treasury in better condition to-day than for years. I am particularly gratified to note the increased interest in the old Society by many of our members who have not been with us recently. Of course the numerous local societies have done something to draw from our numbers, but the waning strength of some of these has brought many of the children home to the mother society where they are always welcome.

Our annual fair in September, at Utica, was a very full and interesting exhibition, particularly in farming implements and blooded stock. We were fortunate in having pleasant weather, our attendance was exceptionally large, and nothing occurred to mar its success. I trust the increased interest that has been manifested the past year may continue, and in the near future our meetings may be what they were for so many years, one of the most delightful reunions that New York farmers can enjoy. Now that science is doing so much for the world, there is certainly enough novelty continually cropping up in the way of agriculture and its machinery to interest us, and there is no way of learning the application of these new ideas as thoroughly as by meeting together and discussing them, and giving each other the benefit of our several experiences. Nearly all manufacturers have their societies to meet and discuss subjects of interest to them and their employes; then why not the farmer? It is true there are town societies that meet in the winter for this purpose, but necessarily at a State gathering it would furnish a much larger scope for facts and results of experiments. At our recent fair at Utica, the evening devoted to the discussion of silos was one of great interest to a very full attendance, and many facts of great value to those interested in this experiment were brought out. I should like to see these discussions more a feature of our gatherings than they have been of recent years, and I think the Society should edit and publish a report at least monthly, giving its mem-

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bers carefully collected facts bearing on agricultural interests in this State, and its columns should be open to all who would favor us with papers on any subjects of interest to the farmers of New York. Of course this would require to be under the direction of the board. But let us put more life into the Society; we have the means, we have the influence, and with proper energy our usefulness would be much extended.

Why is it to-day that farming lands in the great State of New York are worth little if any more than they were forty or fifty years ago? Lands in the far west have increased in tremendous ratio. Of course there are many reasons why these lands in the west should advance, but why is it our farms do not? The discrimination against our State by the railroads has done some of this, but not all; a good deal is due to the apathy of our farmers; many of them are working as did their grandfathers, waiting for certain stages of the moon to plan their work, and treating their cattle when sick by boring their horns, and such absurd nonsense; there are thousands of such in our State. This all comes from want of education, and is it not our mission to enlighten them, and may we not do it by proper efforts? Agriculture is the noblest pursuit of man, and why should not the same energy be put forth in its success as in the arts, science or business generally? Many of us do not realize the fact that our State contains nearly one-tenth of the entire population of the country. Is there sufficient reason for us to sit down and bewail our position because the great west can send us grain and meat at less money than we can produce it? Let us buy our grain and meat where we can buy it cheapest, and instead of vain efforts at legislation to hamper railroads in their business, let us apply ourselves to such labor as will be productive of profit to us. The day of old-fashioned farming, as it is called, is past; to be successful now a farmer must be progressive; he must practice what is called high farming. Let each adopt some specialty which is best adapted to his surroundings and master it thoroughly, so as to attain success through his superior knowledge of his business. To feed five millions of people in the State of New York offers enough for all of us to do.

In your live-stock, realize the fact that it costs no more to keep a good animal than a poor one. Breed up in whatever line you may be interested. Our old style of cattle and sheep served the purposes of their day, but necessity has shown us that they cannot compete with the improved breeds of the present. There is no occasion for a farmer to go into fancy stock and pay enormous prices in competition with those who farm for pleasure, but by the use of pure sires the quality of a breed may soon be implanted in a herd of high grades. It is a great mistake to use any but a pure-bred sire.

Many make the further mistake of trying to cultivate too much land. The result is they succeed in nothing. Ten acres properly cultivated are worth fifty half done. One of the greatest drawbacks we have to-day is high labor; it is more expensive than anything else in proportion, and without good reason. There is some probability that the tariff, that was passed as a war measure, may be so modified that the onerous taxes of the past twenty years may be removed, thus enabling the working man to accept lower reward for his labor, as the cost of living shall be proportionately reduced.

A great aid of agriculturists has been organized by our State Legislature in the establishment of the New York Agricultural Experiment Station at Geneva, under the efficient management of the scientific and practical Dr. E. L. Sturtevant. Necessarily its results as proven by practice will come to us slowly, as conclusions are not to be anticipated, but worked out in the most thorough manner. I look

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forward to the lessons to be learned at this institution with great confidence, and anything we can do to aid the station, should be our pleasure. Although it is a separate organization, it is so nearly allied to ours that our interest should be identical. With the liberal aid given us by our State Legislature, let us prove ourselves worthy of the trust confided, and leave no stone unturned to enlighten our farmers, and put into them some of the progressive spirit of the age. When this is accomplished we shall hear fewer complaints of their sons leaving the farm for the more alluring life of the cities.

Reviewing the whole field, there is little reason for the discouragement so often expressed by the farmers of this State. A kind Providence has the past year given to us bountiful returns for our labor, and the prospects for the future of the farmer in the State of New York are quite as bright as for any other industry.

In retiring from the position of president of the Society, I beg to express my thanks to the officers and members of the Board, and to the members generally, for their uniform kindness and courtesy during my administration, and I know that my successor will be as ably seconded.

REPORTS OF COUNTY SOCIETIES.

JEFFERSON COUNTY.

The Secretary of the Jefferson County Agricultural Society sends with the report for 1882, the following statements:

Statement of L. W. Babcock, of Champion, to whom was awarded the first prize for creamery butter.

I set my milk in Ferguson's bureau creamery pans, let it stand about thirty-six hours before skimming, and let the cream stand from twelve to twenty-four hours; churn in a barrel churn; work and salt in butter-worker; let it stand twelve hours, then pack. I put in one ounce of Eureka salt to one pound of butter.

Statement of M. Goulding, of Pamelia, to whom was awarded the first prize for farm dairy butter made in June.

Made June 28, one ounce of Syracuse dairy salt to the pound; worked after churning, then worked and packed the next day; no ice used, use spring water; worked and packed with ladle.

Statement of O. M. Rexford, of Watertown, to whom was awarded the first prize for farm dairy butter made in July.

Use one ounce of Ashton salt to the pound; work with Reid worker and pack direct from the worker.

Statement of W. H. Walrath, of Clayton, to whom was awarded the first prize for farm dairy butter made in August.

The sample is made from the milk of thorough-bred Jerseys, churned in a Davis swing churn; washed in the churn, after the butter milk is drawn off, until the water is clear; salted with Ashton salt, one ounce to the pound; work salt in and let it stand six hours; work again and then pack. Never use any coloring.

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Statement of Sylvester Snell, of Watertown, to whom were awarded three second prizes for farm dairy butter made in June, in July and in August.

Milk twelve cows; milk strained in tin pans, one-half or two-thirds full; stands thirty-six to forty hours; churn every other day; crank churn; Ashton salt, one ounce to the pound; let it stand until morning, then work and pack it with a ladle.

Statement of B. Dickinson, of South Rutland, to whom were awarded the first prize for factory cheese made in July, and the second prize for factory cheese made in August.

The milk was set at eighty-four degrees; was from twenty-five to thirty minutes in coming; then stood thirty-five minutes before cutting the curd. Run one hour; stopped at ninety-six degrees; stood three hours in the scald, then the whey run off and salted; two and three-quarter pounds to one hundred pounds of curd.

Statement of H. C. Eames, of Rutland, to whom were awarded the first prize for factory cheese made in August, and the second prize for factory cheese made in July.

Heat the milk to eighty-four degrees; put in rennet sufficient to coagulate in forty-five minutes; then cut the curd and let the whey rise. Heat to ninety-four degrees, and let it stand thirty minutes; then heat to one hundred degrees. I test with a hot iron when the whey is ready to be drawn and curd packed; when it threads about an inch on the iron it is ground and salted with two and three-quarter pounds of factory filled salt to one hundred pounds of cheese.

Statement of John G. Myers, cheesemaker of the R. L. Sherman factory.

Most of the night's milk is stirred and cooled by the patrons at home. The night's and morning's milk are mixed and heated to eighty-four degrees and rennet added to make it coagulate in forty minutes. It is then cut, lengthwise of the vat, and left twenty minutes to set (stir to make fine curd) before heating to ninety-eight degrees; test by hot iron and smell. After sufficient acid is formed to make a firm cheese, it is put into the curd-sink to drain, then broken fine and salted — three pounds of salt to one thousand pounds of milk; put into hoops and pressed twelve to fifteen hours, then removed to the curing room, the temperature of which is kept at seventy to seventy-four degrees.

ORANGE COUNTY.

The secretary of the Orange County Agricultural Society sends with the report for 1882 the following statements of competitors for the Warwick Valley railroad prizes of thirty and twenty dollars for milk production, the quantity of good milk produced at the least cost and the largest returns from the farm to be considered:

Statement of Edmund T. Mulford, of Shawangunk.

Number of cows, twenty-eight; sold three; bought three; breed, *native.*

DR.

Interest on assessed value of farm, $8,300		$198 00
Value of cows, September 1, 1881		1,120 00
Paid for labor		596 25
Paid for feed, 15 tons brewers' sprouts	$225 00	
Paid for feed, 7 tons brewers' grains	59 50	
Paid for feed, 2 tons wheat feed	69 00	
Paid for feed, 3 tons corn meal	60 00	
Paid for feed, 10 tons starch meal	85 00	
		498 00

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Paid for grass seed		$18 00
Balance		1,907 55
		$4,338 30

CR.

Value of cows, September 1, 1882		$1,260 00
Received for calves sold		60 00
Received for milk sold (whole product, 82,520 quarts)		2,635 80
Received for grain sold: 300 bushels rye	$225 00	
200 bushels oats	120 00	
		345 00
Received for potatoes sold		37 50
		$4,338 30

Statement of Frederick D Tuthill, of Washingtonville.

Average number of cows twenty-two; changed thirteen cows; breed, *native:*

DR.

Interest on assessed value of farm, $5,500		$330 00
Value of 19 cows, September 1, 1881		760 00
Paid for cows		708 00
Paid for labor		200 00
Paid for feed, 2 tons middlings	$52 00	
Paid for feed, 3 tons, 15 pounds bran	66 91	
Paid for feed, 1,275 pounds horse feed	23 47	
Paid for feed, 5,480 pounds corn meal	95 11	
Paid for feed, 500 pounds cotton seed meal	8 25	
Paid for feed, 5,253 pounds corn and cob meal	72 63	
Paid for feed, 84¼ tons brewers' grains	294 47	
		612 84
Paid for grass seed		15 11
Balance		$1,405 05
		$4,091 00

CR.

Value of 20 cows, September 1, 1882	$1,000 00
Received for cows sold	525 00
Received for calves sold	50 00
Received for 77,840 quarts of milk sold	2,516 00
	$4,091 00

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AWARDS.

At the Thirty-seventh Annual Cattle Show and Fair of the New York State Agricultural Society, held at Rochester, September 17 to September 21, 1877.

CATTLE.

SHORTHORNS — SHORTHORN HERD PRIZE.

Charles F. Wadsworth, Geneseo, N. Y., large gold medal.

Bull, Prince of Wolviston, roan, bred by exhibitor, calved April 26, 1876, sire Earl of Seaham 8077, dam Princess of Wolviston by Millbrook 8629, gr. d. Rosa by Berkshire Duke 2539.

Cow, Princess of Wolviston, red, bred by exhibitor, calved July 12, 1872, sire Millbrook 8629, dam Rosa by Berkshire Duke 2539, gr. d. Rosamond by Red Rover 2109.

Cow, Lady Mary 8th, roan, bred by A. W. Griswold, Morristown, Vt., calved August 22, 1872, sire 4th Lord Oxford 5908, dam Lady Mary by Hotspur (31393), gr. d. Baroness by Barrington (30501).

Heifer, Second Princess of Wolviston, red, bred by exhibitor, calved December 8, 1874, sire Baron Bates 3rd 11332, dam Rosa by Berkshire Duke 2539, gr. d. Rosamond by Red Rover 2109.

Heifer, Third Princess of Wolviston, roan, bred by exhibitor, calved January 1, 1876, sire Earl of Seaham 8077, dam Rosa by Berkshire Duke 2539, gr. d. Rosamond by Red Rover 2109.

Heifer, Lady Mary 11th, white, bred by exhibitor, calved December 23, 1876, sire Earl of Seaham 8077, dam Lady Mary 7th by 4th Lord Oxford 5908, gr. d. Lady Mary by Hotspur (31393).

BULLS OVER THREE YEARS OLD.

Fellows & Butts, Manlius, N. Y., first prize, $35; Treble Gloster, red, bred by George Butts, Manlius, N. Y., calved March 31, 1867, sire Apricot's Gloster 2500, dam Spring Beauty by Apricot's Gloster 2500, gr. dam Silkie by Apricot's Gloster 2500.

James Sime, Brockport, N. Y., second prize, $20; Admiral, red and little white, bred by J. W. Wadsworth, Geneva, N. Y., calved February 1, 1874, sire Millbrook 8629, dam Atlanta by Reynolds 6115, gr. d. Alice by Howard 2983.

John H. Starin, Fultonville, N. Y., third prize, $15; Fidget's Oxford, red, bred by Ezra Cornell, Ithaca, N. Y., calved October 21, 1873, sire Beau of Oxford 4538, dam Fidget 5th by Delhi (15865), gr. d. Fidget 4th by 4th Duke of York (10167).

BULLS TWO YEARS OLD.

Mark Harvey, Thorn Hill, N. Y., second prize, $15; Iron Duke, red and white, bred by Ira Young, Jamestown, N. Y., calved April 8, 1875, sire Duke of Poland 21524, dam Cherry by General Grant 21567, gr. d. Rosa by Favorite 10046.

William G. Markham, Avon, N. Y., third prize, $10; Jubula, roan, bred by exhibitor, calved May 1, 1875, sire Baron Bates 3rd 11332, dam Juanita by Marmaduke 5935, gr. l. Princess Julia 2nd by Prince of Wales 5100.

BULLS ONE YEAR OLD.

Charles F. Wadsworth, Geneseo, N. Y., first prize, $20; Prince of Wolviston, roan, bred by exhibitor, calved April 26, 1876, sire Earl of Seaham 8077, dam Princess of Wolviston by Millbrook 8629, gr. d. Rosa by Berkshire Duke 2539.

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BULL CALVES.

Benjamin Fellows, Clifton, N. Y., first prize, $15; Mark Anthony, roan, bred by exhibitor, calved April 10, 1877, sire Treble Gloster 7331, dam Niobe by Clifton Duke 2nd 7711, gr. d. Nannie Williams 10th by Duke of Airdrie 2743.

Charles F. Wadsworth, Geneseo, N. Y., second prize, $10; Tenth Prince of Oxford, roan, bred by exhibitor, calved January 6, 1877, sire Earl of Seaham 8077, dam Oxford Rose by Prince of Oxford 3308, gr. d. Rosalie by Red Rover 2109.

Frank B. Redfield, Batavia, N. Y., third prize, $5; Milksop, white, bred by W. G. Markham, Avon, N. Y., calved February 10, 1877, sire Juba 23589, dam Milkmaid 4th by Bellflower Prince 13202, gr. d. Princess Macula by Prince of Wales 5100.

COWS OVER THREE YEARS OLD.

Charles F. Wadsworth, Geneseo, N. Y., first prize, $25; Lady Mary 8th, roan, bred by A. W. Griswold, Morristown, Vt., calved August 22, 1872, sire 4th Lord Oxford 5903, dam Lady Mary by Hotspur (31393), gr. d. Baroness by Barington (30501).

Charles F. Wadsworth, Geneseo, N. Y., second prize, $20; Princess of Wolviston, red, bred by exhibitor, calved July 12, 1872, sire Millbrook 8629, dam Rosa by Berkshire Duke 2539, gr. d. Rosamond by Red Rover 2109.

Frank B. Redfield, Batavia, N. Y., third prize, $15; Jenny Lind, red, bred by W. G. Markham, Avon, N. Y., calved January 30, 1872, sire Duke of Hillsdale 9865, dam Juanita by Marmaduke 5935, gr. d. Princess Julia 2nd by Prince of Wales 5100.

HEIFERS TWO YEARS OLD.

Charles F. Wadsworth, Geneseo, N. Y., first prize, $20; Second Princess of Wolviston, red, bred by exhibitor, calved December 8, 1874, sire Baron Bates 3rd 11332, dam Rosa by Berkshire Duke 2539, gr. d. Rosamond by Red Rover 2109.

Benjamin Fellows, Clifton, N. Y., second prize, $15; Prairie Maid, red, bred by exhibitor, calved October 28, 1874, sire Imperial Gloster 20026, dam Prairie Blossom by Royal Crown 10916, gr. d. Prairie Lass by Scotchman 7258.

David K. Bell, West Brighton, N. Y., third prize, $10; Gloster's Gem, light roan, bred by exhibitor, calved June 16, 1875, sire Imperial Gloster 20026, dam Kate Fisher by Major 10425, gr. d. Gem of Brighton by Marmaduke 5948.

HEIFERS ONE YEAR OLD.

Charles F. Wadsworth, Geneseo, N. Y., first prize, $20; Third Princess of Wolviston, roan, bred by exhibitor, calved January 1, 1876, sire Earl of Seaham 8077, dam Rosa by Berkshire Duke 2539, gr. d. Rosamond by Red Rover 2109.

Benjamin Fellows, Clifton, N. Y., second prize, $15; Virginia, red with little white, bred by exhibitor, calved December 26, 1875, sire Imperial Gloster 20026, dam Beauty by Prince of Wales 5100, gr. d. Phœnix by Marshal Ney 4156.

William G. Markham, Avon, N. Y., third prize, $10; Vista 4th, red, bred by exhibitor, calved December 12, 1875, sire Major Monroe 17657, dam Vista 2nd by Prince 8866, gr. d. Villa by James 4912.

HEIFER CALVES.

Charles F. Wadsworth, Geneseo, N. Y., first prize, $15; Lady Mary 11th, white, bred by exhibitor, calved December 28, 1876, sire Earl of Seaham 8077, dam Lady Mary 7th by 4th Lord Oxford 5903, gr. d. Lady Mary by Hotspur (31393).

J. A. D. Snell, Adams Centre, N. Y., second prize, $10; Rosy, red and white, bred

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by William G. Markham, Avon, N Y., calved December 10, 1876, sire Josephus, dam Bellena by Major Monroe 17657, gr. d. Joan of Arc by Zerubbabel 9886.

Charles F. Wadsworth, Geneseo, N. Y., third prize, $5; Fourth Princess of Wolviston, red with a little white, bred by exhibitor, calved January 2, 1877, sire Earl of Seaham 8077, dam Rosa by Berkshire Duke 2539, gr. d. Rosamond by Red Rover 21.9.

DEVONS — DEVON HERD PRIZE.

B. F. Peck, East Bethany, N. Y., large gold medal.

Bull, Duke of Flitton 9th, bred by James Davy, North Molton, England, calved July 5, 1871, sire Duke of Flitton 4th (827), dam Cherry 3rd by Duke of Flitton 2nd (825), gr. d. Old Cherry by Duke (30).

Cow, Cowslip, bred by Walter Farthing, Stowey Court, England, calved January 26, 1869, sire Master Alic (881), dam Curley by Leopold (447), gr. d. Cherry by Wonder (845).

Cow, Candy Girl 2nd, bred by Walter Cole, Batavia, N. Y., calved April 13, 1872, sire Lovely's Huron 3rd 591, dam Candy Girl by Empire 5th 213, gr. d. Lovely 8th by imported Candy 153.

Heifer, Helena 2nd, bred by exhibitor, calved February 27, 1875, sire Helena's Huron 9th 545, dam Butterfield's Helena 1st by Batavia 159, gr. d. Helena 11th by imported May Boy 974.

Heifer, Victoria 4th, bred by exhibitor, calved June 25, 1875, sire Nemophila's Huron 621, dam Victoria 2nd by Mohawk 610, gr. d. Victoria by Huron 2nd 250.

Heifer, Victoria 5th, bred by exhibitor, calved January 31, 1876, sire Nemophila's Huron 621, dam Victoria 2nd by Mohawk 610, gr. d. Victoria by Huron 2nd 250.

BULLS OVER THREE YEARS OLD.

B. F. Peck, East Bethany, N. Y., first prize, $20; Duke of Flitton 9th, bred by James Davy, North Molton, England, calved July 5, 1871, sire Duke of Flitton, 4th (827), dam Cherry 3rd by Duke of Flitton 2nd (825), gr. d. Old Cherry by Duke (30).

Walter Cole, Batavia, N. Y., second prize, $15; Cole's Puritan 2nd, bred by exhibitor, calved March 1, 1874, sire Lovely's Huron 3rd, 591, dam Helena 34th by Iroquois 564, gr. d. Helena 33rd by Imported Comet 22.

Walter Cole, Batavia, N. Y., third prize, $10; Norina's Huron, bred by C. S. Wainwright, Rhinebeck, N. Y., calved March 29, 1870, sire Iroquois 564, dam Norina by May Boy (71), gr. d. Nora by Megunticook (251).

BULLS TWO YEARS OLD.

Walter Cole, Batavia, N. Y., first prize, $30; Cole's Puritan 3rd, bred by exhibitor, calved February 21, 1875, sire Lovely's Huron 3rd 591, dam Helena 34th by Iroquois 564, gr. d. Helena 33rd by imported Comet 22.

BULL CALVES.

Walter Cole, Batavia, N. Y., first prize, $15; Puritan Boy, bred by exhibitor, calved May 7, 1877, sire Duke of Flitton 9th 838, dam Helena 34th by Iroquois 564, gr. d. Helena 33rd by imported Comet 22.

B. F. Peck, East Bethany, N. Y., second prize, $10; Flitton, bred by exhibitor, calved December 21, 1876, sire Duke of Flitton 9th 838, dam Victoria 2nd by Mohawk 610, gr. d. Victoria by Huron 2nd 250.

B. F. Peck, East Bethany, N. Y., third prize, $5; Flitton 2nd, bred by exhibitor,

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calved January 11, 1877, sire Duke of Flitton 9th 838, dam Georgiana 5th by Lovely's Huron 3rd 591, gr. d. Georgiana by Sachem (517).

COWS OVER THREE YEARS OLD.

B. F. Peck, East Bethany, N. Y., first prize, $20; Cowslip, bred by Walter Farthing, Stowey Court, England, calved January 26, 1869, sire Master Alic (881), dam Curley by Leopold (447), gr. d. Cherry by Wonder (345).

Walter Cole, Batavia, N. Y., second prize, $15; Lovely 18th, bred by Ambrose Stevens, Batavia, N. Y., calved 1862, sire Young Exeter (765), dam Lovely 3rd by Washington (130), gr. d. Lovely by Megunticook (251).

Walter Cole, Batavia, N. Y., third prize, $10; Lovely 19th, bred by exhibitor, calved March 18th, 1871, sire Queen Anne's Huron 320, dam Lovely 18th by Young Exeter (765), gr. d. Lovely 3rd by Washington (130).

HEIFERS TWO YEARS OLD.

B. F. Peck, East Bethany, N. Y., first prize, $20; Helena 2nd, bred by exhibitor, calved February 27, 1875, sire Helena's Huron 9th 545, dam Butterfield's Helena 1st by Batavia 159, gr. d. Helena 11th by imported May Boy 974.

Walter Cole, Batavia, N. Y., second prize, $15; Lovely 21st, bred by exhibitor, calved January 2, 1875, sire Lovely's Huron 3rd 591, dam Lovely 18th by Young Exeter (765), gr. d. Lovely 3rd by Washington (130).

B. F. Peck, East Bethany, N. Y., third prize, $5; Victoria 4th, bred by exhibitor, calved June 25, 1875, sire Nemophila's Huron 621, dam Victoria 2nd by Mohawk 610, gr. d. Victoria by Huron 2nd 250.

HEIFERS ONE YEAR OLD.

Walter Cole, Batavia, N. Y., first prize, $15; Lovely 23rd, bred by exhibitor, calved January 12, 1876, sire Rod Jacket 1035, dam Lovely 18th by Young Exeter (765), gr. d. Lovely 3rd by Washington (130).

B. F. Peck, East Bethany, N. Y., second prize, $10; Candy Girl 5th, bred by exhibitor, calved May 1, 1876, sire Helena's Huron 8th 544, dam Candy Girl by Empire 5th 213, gr. d. Lovely 8th by Candy 153.

B. F. Peck, East Bethany, N. Y., third prize, $5; Victoria 5th, bred by exhibitor, calved January 31, 1876, sire Nemophila's Huron 621, dam Victoria 2nd, by Mohawk 610, gr. d. Victoria by Huron 2nd 250.

HEIFER CALVES.

Walter Cole, Batavia, N. Y., first prize, $15: Lovely 27th, bred by exhibitor, calved April, 1877, sire Duke of Flitton 9th 838, dam Lovely 21st by Lovely's Huron 3rd 591, gr. d. Lovely 18th by Young Exeter (765).

B. F. Peck, East Bethany, N. Y., second prize, $10; Helena 6th, bred by exhibitor, calved November 4, 1876, sire Helena's Huron 8th 544, dam Helena 47th by Lovely's Huron 3rd 581, gr d. Helena 34th by Iroquois 564.

Walter Cole, Batavia, N. Y., third prize, $5; Lovely 28th, bred by exhibitor, calved July 22, 1877, sire Cole's Puritan 2nd 798, dam Lovely 19th by Queen Anne's Huron 320, gr. d. Lovely 18th by Young Exeter (765).

AYRSHIRES—AYRSHIRE HERD PRIZE.

J. W. Jardine, Hamilton, Ont., large gold medal.

Bull Mars 1st, dark red and white, bred by John McIntyre, Brinley, Canada, calved

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October 5, 1873, sire Abbott 804, C. R., dam Cuthberta 7th by Mars 717, gr. d. Cuthberta 1st (sire and dam imported by Mrs. Cuthbert).

Cow, Bonnie Jess, bred by William Love, Ayrshire, Scotland, calved April, 15, 1871, imported by exhibitor in 1873, and entered in Ontario Stock Register No. 448.

Cow, Blooming Heather, dark brown and white, bred by Mr. Craig, Ayrshire, Scotland, calved March 15, 1871, imported by Jardine & Son, in 1873.

Cow, Princess Louise, dark red and white, bred by J. K. & J. W. Jardine, Ontario, Canada, calved April 21, 1872, sired in Scotland, dam Ayrshire Lass, imported.

Cow, Orphan Lass, red and white, bred by J. K. & J. W. Jardine, Ontario, Canada, calved April 2, 1874, sire Wilson 438 C. R., dam Ayrshire Lass, imported.

Heifer, Heather Belle, red and white, bred by J. K. & J. W. Jardine, Ontario, Canada, calved November 10, 1874, sire Wilson 438 C. R., dam Bonnie Jess, imported by Jardine & Son.

BULLS OVER THREE YEARS OLD.

J. W. Jardine, Hamilton, Ontario, first prize, $20; Mars 1st, dark red and white, bred by John McIntyre, Brinley, Canada, calved October 5, 1873, sire Abbot 804 C. R, dam Cuthberta 7th by Mars 715, gr. d. Cuthberta 1st (sire and dam imported by Mrs. Cuthbert).

James Miller, Penn Yan, N. Y., second prize, $15; Preston King, red and white, bred by Thomas Thompson, Dunbar, Canada, calved August 24, 1873, sire Crown Prince 38 C. R. (imported), dam Anna (imported) by Scottish Chief, gr. d. Dandy.

James McAdam, Terrysburgh, N. Y., third prize, $10; Sir John Moore, dark brown and white, bred by James McAdam, in Scotland, calved June 5, 1872, sire Sir William Wallace, dam Snow Drop by Oliver, gr. d. Heather Belle, by Defiance.

BULLS TWO YEARS OLD.

J. W. Jardine, Hamilton, Ont., first prize, $20; Robert Bruce, red and white, bred by J. K. & J. W. Jardine, Ontario, Canada, calved November 9, 1874, sire Wilson 438 C. R., dam Burns' Jean, imported by Jardine & Son.

John Stryker, Rome, N. Y., second prize, $15; Gansevoort, white and red, bred by exhibitor, calved May 27, 1875, sire 127 Kilmarnock, dam Spotted Beauty 2nd by 208 Rocket, gr. d. Spotted Beauty by 182 Ploughboy.

BULLS ONE YEAR OLD.

C. C. Holton, Rochester, N. Y., first prize, $15; Ryno, red and white, bred by E. L. Coy, West Hebron, N. Y., calved November 28, 1875, sire 860 Stark, dam Kate 2nd by 235 Young Cardigan, gr. d. Kate by 43 imported Comet.

L. D. Ely, Jr., Rochester, N. Y., second prize, $10; Duncan, red and white, bred by exhibitor, calved July 8, 1876, sire 487 Stentor 2nd, dam Chloris by 486 Stentor, gr. d. Daisy 2nd by 81 General Grant.

BULL CALVES.

J. W. Jardine, Hamilton, Ont., first prize, $15; Arthur Mars, red and white, bred by J. W. Jardine & Son, Hamilton, Ont., calved October 25, 1876, sire Mars 1st 808 C. R., dam Orphan Lass by Wilson 438 C. R., gr. d. Ayrshire Lass, imported.

John Stryker, Rome, N. Y., second prize, $10; red and white, bred by exhibitor, calved April 1, 1877, sire 86 Carlin, dam Lady Peters by 134 Kyle, gr. d. Phemie by 82 Buccleuch.

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COWS OVER THREE YEARS OLD.

J. W. Jardine, Hamilton, Ont., first prize, $20; Blooming Heather, dark brown and white, bred by Mr. Craig, Ayrshire, Scotland, calved March 15, 1871, imported by Jardine & Son, 1873.

J. W. Jardine, Hamilton, Ont., second prize, $15; Orphan Lass, red and white, bred by J. K. & J. W. Jardine, Ontario, Canada, calved April 2, 1874, sire Wilson 438 C. R., dam Ayrshire Lass, imported.

James Miller, Penn Yan, N. Y., third prize, $10; White Rose, white with red spots, bred by Thomas Thompson, Dunbar, Canada, calved April 18, 1870, sire Heather Jock 37 C. R., dam Spotted Beauty by Billy 49 C. R., gr. d. Emilie by imported Cuthbert.

HEIFERS TWO YEARS OLD.

J. W. Jardine, Hamilton, Ont., first prize, $20; Heather Belle, red and white, bred by J. K. & J. W. Jardine, Ontario, Canada, calved November 10, 1874, sire Wilson 438 C. R., dam Bonnie Jess, imported by Jardine & Son.

J. M. Thomas, Cuba, N. Y., second prize, $15; Daisy, red and white, bred by E. B. Hawks, Wells' Bridge, N. Y., calved April 4, 1875, sire Peveril 770, dam Bessy by Lord Cuthbert 1278, gr. d. Nanette 4th by Hero (bred by Thomas Irving of Montreal).

James Miller, Penn Yan, N. Y., third prize, $10; Daisy, red and white, bred by exhibitor, calved February 18, 1875, sire Colin 1457, dam White Rose by Heather Jock 37 C. R., gr. d. Spotted Beauty by Billy 49 C. R.

HEIFERS ONE YEAR OLD.

J. W. Jardine, Hamilton, Ont., first prize, $15; Hamilton Lass, dark red with a little white, bred by Jardine & Son, Ontario, Canada, calved October 4, 1875, sire Cherokee 444 C. R., dam Blooming Heather, imported by Jardine & Son in 18 3.

J. W. Jardine, Hamilton, Ont., second prize, $10; Mauckline Belle, red and white, bred by Jardine & Son, Ontario, Canada, calved September 29, 1875, sire Billy Muir 564 C. R., dam Burns' Jean, imported.

J. W. Jardine, Hamilton, Ont., third prize, $5; Beauty Bride, red and white, bred by Jardine & Son, Ontario, Canada, calved September 21, 1875, sire Cherokee 444 C. R., dam Princess Louise, imported in dam Ayrshire Lass.

HEIFER CALVES.

J. M. Thomas, Cuba, N. Y., first prize, $15; Pride of the Hills, red and white, bred by exhibitor, calved April 10, 1877, sire Jupiter 1286, dam Daisy by Peveril 770, gr. d. Bessy by Lord Cuthbert 1278.

J. W. Jardine, Hamilton, Ont., second prize, $10; Gracie Mars, red and white, bred by Jardine & Son, Ontario, Canada, calved October 21, 1876, sire Mars 1st 808 C. R., dam Blooming Heather, imported.

C. C. Holton, Rochester, N. J., third prize, $5; Melvina, red and white, bred by exhibitor, calved April 15, 1877, sire 487 Stentor 2nd, dam Tibbie by 119 John Gilpin, gr. d. Jennie by 124 Kilburn.

JERSEYS—JERSEY HERD PRIZE.

J. A. & I. T. Burden, Troy, N. Y., large gold medal.

Bull, Macgregor of Woodside, solid fawn, calved 1871, imported by exhibitors.

Cow, Lady Anna, fawn and white, imported by W. H. Schieffelin, calved in 1867.

Heifer, Fear Not, fawn and white, bred by John Arthur, St. Mary's, Jersey, calved 1875, sire Sans Peur (201), dam Lady of the Isles by Brown Prince (85).

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Heifer, Pansy 2nd, reddish fawn and white, bred by P. J. Brideaux, St. Ouens, Jersey, calved 1875, sire Hero (220) dam Pansy.

Heifer, Lady Evelyn 2nd, fawn and gray, bred by exhibitors, calved December 18, 1875, sire Macgregor of Woodside 2479, dam Lady Evelyn, imported.

Heifer, Fear Not 2nd, bred by exhibitors, calved June 13, 1877, sire Bobby (in Jersey), dam Fear Not, imported by exhibitors.

BULLS OVER THREE YEARS OLD.

J. A. & I. T. Burden, Troy, N. Y., first prize, $20; Macgregor of Woodside, solid fawn, calved 1871, imported by exhibitors.

A. G. Barlow & Co., North Ridgeway, N. Y., second prize, $15; Bodine, fawn and black, little white, calved March 1, 1873, imported in dam Lady Gaudin.

J. E. Hazleton, Leroy, N. Y., third prize, $10; Romeo, fawn and white, bred by J. B. Enos, Waterford, N. Y., calved 1873, sire Prince of Wales 4980, dam Dora by Dr. Panglos.

BULLS TWO YEARS OLD.

W. A. Wadsworth, Geneseo, N. Y., first prize, $20; Bingo, fawn, bred by C. S. Sargent, Brookline, Mass., calved March 5, 1875, sire Motley 515, dam Bessie, imported by E. F. Bowditch, Framingham, Mass.

George Sidney Camp, Oswego, N. Y., second prize, $15; Kilbourn, smoky fawn, four white feet, bred by exhibitor, calved February 26, 1875, sire Beacon Comet 13th, 1281, dam Helen by Derby 258, gr. d. Buttercup by Fashion 862.

L. D. Ely, Jr., Rochester, N. Y., third prize, $10; Pure Gold, dark fawn, black points, calved September 21, 1874, bred by Frank Ford, Ravenna, Wis., sire Butter Stamp 700, dam Lady Palestine by Jersey Prince 1062, gr. d. Palestine 2nd by General Scott 46.

BULL CALVES.

J. A. & I. T. Burden, Troy, N. Y., first prize, $15; Lord Lovel, bred by exhibitors, calved July 12, 1877, sire Whetstone 2121, dam Lady Anna, imported.

L. D. Ely, Jr., Rochester, N. Y.. second prize, $10; fawn, white on feet and tail, bred by B. B. Woodworth, Cortland, N. Y., calved April 5, 1877, sire Beacon Comet 16th 1282, dam Mocha 2nd by Mount Peter 1320, gr. d. Mocha by Jerry 2nd 513.

COWS OVER THREE YEARS OLD.

J. A. & I. T. Burden, Troy, N. Y., first prize, $20; Lady Anna, fawn and white, imported by W. H. Schieffelin, calved 1867.

J. A. & I. T. Burden, Troy, N. Y., second prize, $15; Matchless, gray fawn and white, bred by Mr. Le Brocq, St. Peters, Jersey, calved in spring of 1868, imported in 1870.

George Sidney Camp, Owego, N. Y., third prize, $10; Molly Oaks, smoky fawn, black points, bred by M. Alexander, St. Ouens, Island of Jersey, calved March, 1869; imported September, 1870.

HEIFERS TWO YEARS OLD.

J. A. & I. T. Burden, Troy, N. Y., first prize, $20; Pansy 2nd, reddish fawn and white, bred by P. J. Brideaux, St. Ouens, Jersey, calved 1875, sire Hero (220), dam Pansy.

J. A. & I. T. Burden, Troy, N. Y., second prize, $15; Fear Not, fawn and white, bred by John Arthur, St. Mary's, Jersey, calved 1875, sire Sans Peur (201), dam Lady of the Isles by Brown Prince (85).

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L. D. Ely, Jr., Rochester, N. Y., third prize, $10; Mocha 2nd, fawn, little white, bred by B. B. Woodworth, Cortland, N. Y., calved March 28, 1875, sire Mount Peter 1320, dam Mocha by Jerry 2nd 513, gr. d. Sally by Harry 92.

HEIFERS ONE YEAR OLD.

J. A. & I. T. Burden, Troy, N. Y., first prize, $15; Pearl Armstrong 2nd, light fawn, white on flanks, bred by Robert C. Armstrong, Jefferson county, Ky., calved March 10, 1876, sire Coupon 1024, dam Pearl Armstroug by Young Baron 702, gr. d. Virtue Lass, imported.

J. A. & I. T. Burden, Troy, N. Y., second prize, $10; Lady Evelyn 2nd, fawn and gray, bred by exhibitors, calved December, 1875, sire Macgregor of Woodside 2479, dam Lady Evelyn, imported.

L. D. Ely, Jr., Rochester, N. Y., third prize, $5; Lady Star, fawn, star on forehead, bred by B. B. Woodworth, Cortland, N. Y., calved March 31, 1876, sire Beacon Comet 16th 1282, dam Mocha by Jerry 2nd 513, gr. d. Sally by Harry 92.

HEIFER CALVES.

J. A. & I. T. Burden, Troy, N. Y., first prize, $15; Fear Not 2nd, bred by exhibitors, calved June 18, 1877, sire Bobby (in Jersey), dam Fear Not, imported by exhibitors.

J. A. & I. T. Burden, Troy, N. Y., second prize, $10; Lady Evelyn 3rd, bred by exhibitors, calved December 7, 1876, sire Macgregor of Woodside 2479, dam Lady Evelyn, imported.

George Sidney Camp, Owego, N. Y., third prize, $5; Lorinda, French gray, white spots under belly and on legs, bred by exhibitor, calved January 4, 1877, sire Kilbourn 2029, dam Molly Oaks, bred by M. Alexander, St. Ouens, Island of Jersey.

HOLSTEINS — HOLSTEIN HERD PRIZE.

Unadilla Valley Stock Breeders' Association, West Edmeston, N. Y., large gold medal.

Bull, Burgomaster of the Beemster, black and white, calved March, 1874, bred by G. I. Hongerveld, of North Holland.

Cow, Jacoba Hartog, black and white, bred by Jacob Hartog, of the Beemster, North Holland, calved March, 1874.

Cow, Maid of Twisk, black and white, bred by F. Slot, of Twisk, Province of North Holland, calved November, 1870.

Cow, Marianna Beets, black and white, bred by Jan Beets, Jr., of the Beemster, North Holland, calved March 3, 1874.

Cow, Imka Beets, white and black, bred by Jan Beets, Jr., of the Beemster, North Holland, calved March 2, 1874.

Cow, Cjrietje Bleeker, black and white, bred by Cornelia Bleeker, of the Beemster, North Holland, calved March, 1874.

BULLS OVER THREE YEARS OLD.

Unadilla Valley Stock Breeders' Association, West Edmeston, N. Y., first prize, $20; Burgomaster of the Beemster, black and white, calved March, 1874, bred by G. I. Hongerveld, of North Holland.

BULLS TWO YEARS OLD.

C. Pratt, Syracuse, N. Y., first prize, $20; Duke of York, white and black, bred by John H. Comer, Goshen, N. Y., calved October 24, 1874, sired in Holland, dam Lina, imported.

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BULLS ONE YEAR OLD.

John Stryker, Rome, N. Y., first prize, $15; Fourth Prince of Orange, black, with little white, bred by Oneida Community, Oneida N. Y., calved February 12, 1876, sire Prince of Orange, dam Midwould 15th by Texelaar 6th 44, gr. d. Midwould 2nd by 2nd Dutchman 37.

BULL CALVES.

Unadilla Valley Stock Breeders' Association, West Edmeston, N. Y., first prize, $15; Burg Hartog, black and white, bred by exhibitors, calved March 25, 1877, sire Burgomaster of the Beemster, imported, dam Maid of Twisk, imported.

COWS OVER THREE YEARS OLD.

Unadilla Valley Stock Breeders' Association, West Edmeston, N. Y., first prize $20; Maid of Twisk, black and white, bred by F. Slot, of Twisk, Province of North Holland, calved November, 1870.

HEIFERS ONE YEAR OLD.

Unadilla Valley Stock Breeders' Association, West Edmeston, N. Y., first prize, $15; Jennie Ellswout, black and white, bred by exhibitors, calved April 11, 1876, sire Ellswout, imported, dam Neiltje Korndyke, imported.

HEIFER CALVES.

John Stryker, Rome, N. Y., first prize, $15; Lea 2nd, black with little white, bred by exhibitor, calved February 6, 1877, sire Prince of Orange, dam Lea, imported by John H. Comer, Goshen, N. Y.

Unadilla Valley Stock Breeders' Association, West Edmeston, N. Y., second prize, $10; Lena, black and white, bred by exhibitors, calved April 20, 1877, sire Burgomaster of the Beemster, imported, dam Elizabeth, imported.

MILCH COWS AND GRADES—MILCH COWS OF ANY BREED.

David K. Bell, West Brighton, N. Y., first prize, $20; Lady Darling 2nd, red, with little white, 8 years, sire Major 10425, short-horn, dam Lady Darling, grade.

Unadilla Valley Stock Breeders' Association, West Edmeston, N. Y., second prize, $15; Jacoba Hartog, black and white, bred by Jacob Hartog, of the Beemster, North Holland, calved March, 1874, last calf March 25, 1877.

Unadilla Valley Stock Breeders' Association, West Edmeston, N. Y., third prize, $10; Cjrietje Bleeker, black and white, bred by Cornelia Bleeker, of the Beemster, North Holland, calved March. 1874, last calf November 8, 1876.

SHORT-HORN GRADE COWS AND HEIFERS.

David K. Bell, West Brighton, N. Y., first prize, $15; Sprightly, red, five years, sire Major 10425, dam grade short-horn.

John Stryker, Rome, N. Y., second prize, $10; Rosa Bonheur, roan, bred by Reynhold Sybold, Waterloo, N. Y., calved May 28, 1870, sire Royal Duke of Oxford, dam Agnes, short-horn grade.

James F. Guthrie, York, N. Y., third prize, $5; Dolly Varden, spotted red and white, calved May, 1871, sire short-horn, dam grade short-horn.

DEVON GRADE COWS AND HEIFERS.

A. W. Smith, Cuba, N. Y., second prize, $10; Maud, red, bred by exhibitor, calved April 15, 1871, sire General Grant 2nd, Devon, dam Cherry, grade short-horn, last calf April 15, 1877.

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FAT OXEN OVER FOUR YEARS OLD.

Geo. D. Dover, Avon, N. Y., first prize, $15; Dan Lacy, red, five years, bred by Daniel Lacy, Avon, sire thoroughbred Durham, dam high grade.

B. Diven, Henrietta, N. Y., second prize, $10; spotted red and white, four years.

B. Diven, Henrietta, N. Y., third prize, $5; spotted red and white, four years.

FAT STEERS THREE YEARS OLD AND UNDER.

Orin Bushman, East Mendon, N. Y., first prize, $15; grade, red and white.

FAT COWS OVER FOUR YEARS OLD.

David K. Bell, West Brighton, N. Y., first prize, $15; red and little white, four years, three-fourths short-horns.

HORSES.

BREEDING AND GROWING STOCK—STALLIONS FOR GENERAL PURPOSES.

Special premium for the best stallion for general purposes, over six years old, and not less than fifteen hands two inches high, that has been kept for mares the past season, and has served not fewer than fifteen. Open to all stallions in the United States and Canada.

John H. Starin, Fultonville, N. Y., first prize, $75; The Commodore, bay, 15 3, 14 years, sire Guy Miller, dam by American Star.

N. Palmer, Rochester, N. Y., second prize, $50; Mark Antony, dark bay, 15.3, 9 years, sire Hamlet, dam Sterling's dam by Bay Richmond.

George F. Mabey, Fleming, N. Y., third prize, $25; Burton, bay, 16, 7 years, sire Coleman's Seneca Chief, dam by Bashaw, gr. d. by Normand.

Stallions for general purposes, each to be accompanied by not less than five of his produce one year old or over, the merits of both sire and produce to be considered.

W. C. J. Wood, Knoxville, Pa., first prize, $75; Wood's Hambletonian, dark bay roan, 15.2½, 18 years, by Edsall's Hambletonian.

Theodore Coleman, Sheldrake, N. Y., second prize, $50; Seneca Chief, bay, 15.2½, 13 years, bred by Col. Jordan, Bullville, N. Y., sire Rysdyk's Hambletonian, dam by Young Hector, gr d. by Walden Messenger.

Adams Underwood and George Rockham, Middlesex, N. Y., third prize, $25; Monroe Morgan, chestnut, 16, 12 years, bred by Isaac S. Wells, Perinton, N. Y., sire Rutland Morgan by Hale's Green Mountain Morgan, dam Nellie Norman by Bathgate's Norman.

CLYDESDALE STALLIONS OVER FIVE YEARS OLD.

George Malcolm, Marion, N. Y., first prize, $20; Nonesuch, bay, 16 3, 7 years, bred by James Carniegie, Canada, sire Netherby, dam by imported Old Clyde, gr. dam imported Clyde mare.

PERCHERON STALLIONS OVER FIVE YEARS OLD.

John H Starin, Fultonville, N. Y., first prize, $20; Baron Hausman, black, 16.2, 5 years, imported.

W. A. Wadsworth, Geneseo, N. Y., second prize, $15; Napoleon, white, 16, 12 years, sire imported Conqueror, dam imported Empress.

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DRAUGHT STALLIONS OVER FIVE YEARS OLD — ANY OTHER BREED.

C. Diven, West Brighton, N. Y., first prize, $20; Young Clyde, bay, 16.2, 6 years, bred by J. D. Adams, Climax Prairie, Mich.

John Young, Syracuse, N. Y., second prize, $15; Anglo Saxon, black, 16.2, 5 years, by Robin Hood, Jr., dam by Jones' Sir Henry.

L. M. Loss, Montreal, Canada, third prize, $10; Canada Feather, black, 15, 8 years, sire a Vermont Morgan by Justin Morgan, dam Canadian French.

DRAUGHT STALLIONS UNDER FIVE AND OVER THREE YEARS OLD.

David J. McKnutt, Palmyra, N. Y., first prize, $20; Young Champion, mahogany bay, 16.2, 4 years, sire Clydesdale, dam Norman.

William H. Sawyer, Palmyra, N. Y., second prize, $15; Scotch, bright bay, 16.1, 4 years, bred by Enos D. Booth, sire imported, dam by Dillon horse.

A. & J. McPherson, Le Roy, N. Y., Percheron stallion Louis, gray, 15.1, 3 years, sire imported Lancer.

DRAUGHT STALLIONS UNDER THREE YEARS.

John Littlefield, Buffalo, N. Y., first prize, $15; Weston Chief, dark bay, white face, 16.1, 2 years, sire Drayman (Clydesdale, imported from Scotland), dam Hard Fortune (Clydesdale, imported from England).

A. & J. McPherson, Le Roy, N. Y., second prize, $10; Percheron stallion Leo, gray, 2 years, sire imported Lancer.

David J. McKnutt, Palmyra, N. Y., third prize, $5; Joker, bright bay, 15.1½, 1 year, sire imported Clydesdale, dam Norman.

DRAUGHT MARES WITH FOALS AT FOOT.

E. R. Palmer, Rochester, N. Y., third prize, $10; bay, 16, 7 years.

DRAUGAT FILLIES UNDER FIVE AND OVER THREE YEARS OLD.

Frank D. Ward, Le Roy, N. Y, first prize, $20; Norman Percheron, gray, 16, 4 years, sire imported Lancer, dam by Samson.

Frank D. Ward, Le Roy, N. Y., second prize, $15; gray, 16.2, 3 years, sire imported Lancer, dam by Gray Norman.

A. & J. McPherson, Le Roy, N. Y., third prize $10; Percheron filly Eugenie, gray, 3 years, sire imported Lancer.

DRAUGHT FILLIES UNDER THREE YEARS OLD.

Isaac S. Wells, Egypt, N. Y., first prize, $15; Stella Howard, bay, 2 years, bred by exhibitor, sire Monroe Morgan, dam by Genesee Black Hawk, gr. d. by May Duke.

CARRIAGE STALLIONS OVER FIVE YEARS OLD AND NOT LESS THAN FIFTEEN HANDS THREE INCHES HIGH, FOR GETTING CARRIAGE AND CAVALRY HORSES.

Daniel D. Johnson, Romulus, N. Y., first prize, $20; Young Sir Henry, bay, 16, foaled June 12, 1872, sire Old Sir Henry, dam Kate by Knight's Black Hawk, gr. d. by Black Prince.

Augustus Tufts, Malden, Mass., and Orson Moulton, Byron, N. Y., second prize, $15; Mambrino Lance, black, 16, 8 years, bred by Dr. L. Herr, Lexington, Ky., sire Mambrino Patchen, dam Lucy Garnet by Endorser, gr. d. Lucy Fowler, imported.

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George F. Mabey, Fleming, N. Y., third prize, $10; Burton, bay, 16, 7 years, sire Coleman's Seneca Chief, dam by Bashaw, gr. d. by Norman.

CARRIAGE STALLIONS FOUR YEARS OLD.

Simon Butts and D. H. Robinson, Greece, N. Y., first prize, $20; Monroe Chief, bay, 16, bred by exhibitors, sire Mambrino Patchen, dam by Rysdyk's Hambletonian, gr. d. by Jupiter by Long Island Black Hawk.

R J. Hunn, Batavia, N. Y., second prize, $15; Rufus J., bay, 16, sire Foster's St. Lawrence.

Benjamin Long, Greece, N. Y., third prize, $10; Black Dick, black, 16.

CARRIAGE STALLIONS THREE YEARS OLD.

Daniel Davey, Greece, N. Y., first prize, $15; Eddie D., black, sire Butt's Royal George.

Lorando Sharp, Lockport, N. Y., second prize, $10; bay, sire Niagara Chief, dam Kit Bloomer by One-eyed Kentucky Hunter.

Henry Heron, Buffalo, N. Y., third prize, $5; Primate, bay, 16.1, sire Luck's All, dam by imported Performer.

CARRIAGE STALLIONS TWO YEARS OLD.

H. M. Littel, Macedon, N. Y., first prize, $15; Tremont, bay with star, 16, foaled March 19, 1875, bred by A. J. Alexander, Spring Station, Ky., sire Belmont by Alexander's Abdallah, dam Virginia by Alexander's Abdallah, gr. d. Gray Goose by Nottingham Norman.

CARRIAGE STALLIONS ONE YEAR OLD.

H. Goodell, North Parma, N. Y., first prize, $15; Tommy, brown.

Alfred Young, Rochester, N. Y., second prize, $10; Alfred Young, black, sire Alamode.

CARRIAGE MARES NOT LESS THAN 15.3 WITH FOALS AT FOOT.

Randolph L. Huntington, Rochester, N. Y., first prize, $20; Belle Partise, brown, 16, 9 years, sire Tucker Horse, dam by imported Consternation, gr. d. by Dey's Messenger, sire of foal Narraganset.

CARRIAGE FILLIES FOUR YEARS OLD.

James B. Shearer, Pittsford, N.Y., first prize, $20; Flora, bay, two white feet, 16.

A. W. Smith, Cuba, N. Y., second prize, $15; Kate S., brown, 15.2, sire Jeff. Davis, dam Kate by Morgan.

Frank B. Redfield, Batavia, N. Y., third prize, $10; Exile, brown, 16, bred by Dr. Herr, Lexington, Ky., sire Mambrino Patchen, dam Susan Ann by imported Glencoe, gr. d. by Wagner.

CARRIAGE FILLIES THREE YEARS OLD.

David Montgomery, Rochester, N. Y., first prize, $20; bay, sire Young Royal George, dam by Dan Rock.

CARRIAGE FILLIES TWO YEARS OLD.

Orestes Carr, Bristol Centre, N. Y., first prize, $15; Ruth, bay, 15.3, sire Gooding's Champion, dam Queen Ann by Fashion Clay.

Orestes Carr, Bristol Center, N. Y., second prize, $10; Orphan, bay, 15.3, sire Gooding's Champion, dam Rose by Fashion Clay.

B. Harman, Spencerport, N. Y., third prize, $5; brown, sire Young Royal George.

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CARRIAGE FILLIES ONE YEAR OLD.

Linwood Bates, Rushville, N. Y., first prize, $15; Belle Morgan, chestnut, bred by Jos. Reynolds, Middlesex, N. Y., sire, Monroe Morgan, dam by Gooding's Champion, gr. d. by Carr's Consternation.

B. Harman, Spencerport, N. Y., third prize, $5; bay, sire Young Royal George.

ROADSTER STALLIONS OVER FIVE YEARS OLD, LESS THAN FIFTEEN HANDS THREE INCHES, AND NOT LESS THAN FIFTEEN HANDS.

Davis, Leyden & Snyder, Rochester, N. Y., first prize, $20; Seneca, bay, 15 3, five years, sire Seneca Chief by Rysdyk's Hambletonian, dam by Coleman's American Star, gr. d. by Rattler.

Charles Robinson, Fishkill, N. Y., second prize, $15; gray, 15.2, six years, sire Rysdyk's Hambletonian, dam by Col. Walker.

W. C. & J. Wood, Knoxville, Pa., third prize, $10; Wood's Hambletonian, dark bay roan, 15.2¼, eighteen years, by Edsall's Hambletonian.

ROADSTER STALLIONS FOUR YEARS OLD.

S. F. Curry, Hornellsville, N. Y., first prize, $20; Dan Mace, roan, by Wood's Hambletonian, dam by Prince John (by Bay Norman).

D. L. Kase, Lodi, N. Y., second prize, $15; Seneca Gold Dust, golden chestnut, 15, sire Eden Gold Dust, dam by Grayhound, gr. d. by Hickory.

ROADSTER STALLIONS THREE YEARS OLD.

Dauphin Dexter, Whitesville, N. Y., first prize, $15; Allegany Boy, roan, sire Wood's Hambletonian.

ROADSTER STALLIONS TWO YEARS OLD.

La Trace & Turpin, Rochester, N. Y., first prize, $15; Rochester, dark brown, sire Rysdyk's Hambletonian, dam Lady Kimball by Tippoo, gr. d. by Tom Kimball.

Gordon Merritt, South Butler, N. Y., second prize, $10; Governor Tilden, bay, 15.1, sire Royal George, Jr.

L. J. Woolsey, Macedon, N. Y., third prize, $5; Clay Chief, black, sire Enoch Arden by Cassius M. Clay, dam by old Henry Clay, gr. d. by Tormentor.

ROADSTER STALLIONS ONE YEAR OLD.

George Woodworth, Pittsford, N. Y., first prize, $15; Star, bay, sire Hawk Chief, dam by Coleman's American Star.

A. W. Smith, Cuba, N. Y., second prize, $10; Gabe, bay, sire Jeff. Davis, dam by Nero, gr. d. by Monmouth Beauty.

ROADSTER MARES LESS THAN FIFTEEN HANDS THREE INCHES, AND NOT LESS THAN FIFTEEN HANDS WITH FOALS AT FOOT.

Simon Butts, Greece, N. Y., first prize, $20; bay, 15.2, twelve years, sire Slater's St. Lawrence (Foster horse), foal by Monroe Chief.

John Mason, East Bloomfield, N. Y., second prize, $15; Fanny, bay brown, 15.1, sixteen years, by Guy Collins' Sampson horse, dam by a son of old Bush Messenger, gr. d. by Old Bush Messenger, colt foal at foot by Narragansett (by Rhode Island), May 19.

ROADSTER FILLIES FOUR YEARS OLD.

A. W. Smith, Cuba, N. Y., first prize, $20; Nettie, bay, 15.2, by Jeff. Davis, dam by Reindeer Messenger, gr. d. by imported Sir Isaac.

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Frank B. Redfield, Batavia, N. Y., second prize, $15; Daciana, black, 15.2, sire Harold, dam Dacia by Woodford Mambrino, gr. d. Dahlia by Pilot, Jr.

D. L. Kase, Lodi, N. Y., third prize, $10; Lady Ellsworth, bay, 15, sire Col. Ellsworth, dam by Blooming Grove, gr. d. by Sir Henry Duroc.

ROADSTER FILLIES THREE YEARS OLD.

Isaac S. Wells, Egypt, N. Y., first prize, $15; Victress, black, sire Monroe Morgan, dam by Sir Yankee.

David Montgomery, Rochester, N. Y., second prize, $10; dark bay, sire Young Royal George.

L. D. Ely, Jr., Rochester, N. Y., third prize, $5; Lady Morgan, chestnut, 15.1, sire Monroe Morgan, dam Lady Marion by Hall's Patchen, gr. d. by Old St. Lawrence.

ROADSTER FILLIES TWO YEARS OLD.

David Montgomery, Rochester, N. Y., first prize, $15; bay, sire Young Royal George.

George Woodworth, Pittsford, N. Y., second prize, $10; Gentle Annie, bay, sire Hawk Chief, dam by Gilbert's Long Island Black Hawk.

ROADSTER FILLIES ONE YEAR OLD.

H. M. Littel, Macedon, N. Y., first prize, $15; Belle of Ashland, bay, star, white on one fore foot, sire Post's Hambletonian by Rysdyk's Hambletonian, dam by American Clay, gr. d. by Downing's Bay Messenger.

Leonard L. Cramer, Macedon, N. Y., second prize, $10; Fleety Wells, bay, sire Wm. Welch, dam Saucebox by Mambrino Columbus, gr. d. Forrest Maid by Alexander's Edwin Forrest.

John Mason, East Bloomfield, N. Y., third prize, $5; Whitefoot, bay, by Narragansett by Rhode Island, dam Fanny by Guy Collins' Samson horse, etc.

WORK HORSES.

PAIRS OF FARM OR TEAM HORSES WEIGHING LESS THAN 2,500 POUNDS AND NOT LESS THAN 2,000 POUNDS THE PAIR.

Henry D. Turner, Ridgeway, N. Y., first prize, $20; cream geldings, 15¼, seven and eight years.

PAIRS OF HEAVY CARRIAGE HORSES OVER SIXTEEN HANDS AND NOT LESS THAN 2,400 POUNDS WEIGHT.

Wm. Mackin, Port Hope, Ont., first prize, $20; bay. 16.2.

Isaac C. Otis, Jordan, N. Y., second prize, $15; brown, 16.3, six years.

Joseph Fenell, Sennet, N. Y., third prize, $10.

PAIRS OF CARRIAGE HORSES NOT LESS THAN FIFTEEN HANDS THREE INCHES, NOR MORE THAN SIXTEEN HANDS ONE INCH.

Isaac C. Otis, Jordan, N. Y., first prize, $20; bay, 16, five years.

Alexander Stewart, Albion, N. Y., second prize, $15; dapple brown, 16, seven years.

L. M. Loss, Montreal, Canada, third prize, $10; bays, 16, seven years, sire Phillips Allen, Jr., by Phillips Allen by Black Hawk.

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PAIRS OF LIGHT CARRIAGE HORSES LESS THAN FIFTEEN HANDS THREE INCHES, AND NOT LESS THAN FIFTEEN HANDS.

Norman Schenck, Castile, N. Y., first prize, $20; chestnuts, 15.2, six years.
Henry Craft, Batavia, N. Y., second prize, $15; bays, four and six years, sires John J. Crittenden and Stephen A. Douglass.
George C. Jeffrey, West Kendall, N. Y., third prize, $10; brown, four years.

CART HORSES OVER 1,200 POUNDS WEIGHT.

Daniel C. McPherson, Scottsville, N. Y., first prize, $15; Tom, black, 17, seven years, sire Clydesdale Champion.
James B. Shearer, Pittsford, N. Y., second prize, $10; bay, 16.1, seven years.
Isaac S. Wells, Egypt, N. Y., third prize, $5; Black Dinah, black, eight years, sire Monroe Morgan.

SINGLE HARNESS HORSES FIFTEEN HANDS THREE INCHES HIGH OR OVER.

H. B. Freeman, Fultonville, N. Y., first prize, $15; bay gelding, by Wood's Hambletonian.
R. M. Remington, Auburn, N. Y., second prize, $10; Frank, black, 16, five years.
George J. Whitney, Rochester, N. Y., third prize, $5; Woodford Maid, bay, 16, five years, sire Woodford Chief.

SINGLE HARNESS HORSES FIFTEEN HANDS HIGH AND LESS THAN FIFTEEN HANDS THREE INCHES.

W. C. & J. Wood, Knoxville, Pa., first prize, $15; Nancy Hacket, roan, 15.2, seven years, by Wood's Hambletonian.
Isaac S. Wells, Egypt, N. Y., second prize, $10; Middy Morgan, chestnut, 15.2, six years, sire Monroe Morgan.
James T. Morrison, Ithaca, N. Y.; Frank, light gray gelding, 15.2, eight years.

SADDLE HORSES.

H. Bowen, Medina, N. Y., first prize, $15; bay, four years.
W. A. Wadsworth, Geneseo, N. Y., second prize, $10; Daisy, chestnut, 15.3, six years.
Henry D. Turner, Ridgeway, N. Y., third prize, $5; Tom Thumb, bay gelding, 14, five years.

SHEEP, SWINE AND POULTRY.

LONG-WOOLED SHEEP — LEICESTERS — PENS OF (THREE) LEICESTER EWES OVER TWO YEARS OLD.

D. C. Kurtz, Pittsford, N. Y., second prize, $10; bred by exhibitor.

COTSWOLDS — COTSWOLD RAMS OVER TWO YEARS OLD.

George Ingersoll, Charleston, N. Y., first prize, $15.
George Ingersoll, Charleston, N. Y., second prize, $10.
Joseph Harris, Rochester, N. Y., third prize, $5; Sir Walter Scott.

COTSWOLD YEARLING RAMS.

George Ingersoll, Charleston, N. Y., first prize, $15.
George Ingersoll, Charleston, N. Y., second prize, $10.
George Ingersoll, Charleston, N. Y., third prize, $5.

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PENS OF (THREE) COTSWOLD RAM LAMBS.

George Ingersoll, Charleston, N. Y,, first prize, $15.
Joseph Harris, Rochester, N. Y., second prize, $10.
Joseph Harris, Rochester, N. Y., third prize, $5.

PENS OF (THREE) COTSWOLD EWES OVER TWO YEARS OLD.

George Ingersoll, Charleston, N. Y., first prize, $15.
Joseph Harris, Rochester, N. Y., second prize, $10.
Joseph Harris, Rochester, N. Y., third prize, $5.

PENS OF (THREE) COTSWOLD YEARLING EWES.

Joseph Harris, Rochester, N. Y., first prize, $15.
George Ingersoll, Charleston, N. Y., second prize, $10.
Joseph Harris, Rochester, N. Y., third prize, $5.

PENS OF (THREE) COTSWOLD EWE LAMBS.

Joseph Harris, Rochester, N. Y., first prize, $15.
George Ingersoll, Charleston, N. Y., second prize, $10.
Joseph Harris, Rochester, N. Y., third prize, $5.

MIDDLE-WOOLED SHEEP — SOUTHDOWN RAMS OVER TWO YEARS OLD.

John D. Wing, Washington, N. Y., first prize, $15.
John D. Wing, Washington, N. Y., second prize, $10.
John D. Wing, Washington, N. Y., third prize, $5.

SOUTHDOWN YEARLING RAMS.

John D. Wing, Washington, N. Y., first prize, $15.
John D. Wing, Washington, N. Y., second prize, $10.
John D. Wing, Washington, N. Y., third prize, $5.

PENS OF (THREE) SOUTHDOWN RAM LAMBS.

Frank B. Redfield, Batavia, N. Y., first prize, $10.

PENS OF (THREE) SOUTHDOWN EWES OVER TWO YEARS OLD.

John D. Wing, Washington, N. Y., first prize, $15.
John D. Wing, Washington, N. Y., second prize, $10.
John Lynch, West Brighton, N. Y., third prize, $5 ; bred by exhibitor.

PENS OF (THREE) SOUTHDOWN YEARLING EWES.

John D. Wing, Washington, N. Y., first prize, $15.
John D. Wing, Washington, N. Y., second prize, $10.
Frank B. Redfield, Batavia, N. Y., third prize, $5.

PENS OF (THREE) SOUTHDOWN EWE LAMBS.

John Lynch, West Brighton, N. Y., first prize, $10 ; bred by exhibitor.
John Lynch, West Brighton, N. Y., second prize, $5 ; bred by exhibitor.

PENS OF (THREE) HAMPSHIRE RAM LAMBS.

A. B. Cooley, Canandaigua, N. Y., first prize, $10.

PENS OF (THREE) HAMPSHIRE EWES OVER TWO YEARS OLD.

A. B. Cooley, Canandaigua, N. Y., first prize, $15.

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PENS OF (THREE) HAMPSHIRE YEARLING EWES.

A. B. Cooley, Canandaigua, N. Y., first prize, $15.

PENS OF (THREE) HAMPSHIRE EWE LAMBS.

A. B. Cooley, Canandaigua, N. Y., first prize, $10.

FINE-WOOLED SHEEP—MERINOS BRED FOR FINENESS OF WOOL—RAMS OVER TWO YEARS OLD.

Wm. L. Chamberlain, Red Hook, N. Y., first prize, $15.
Carl Heyne, Red Hook, N. Y., second prize, $10.
Wm. L. Chamberlain, Red Hook, N. Y., third prize, $5.

YEARLING RAMS.

Wm. L. Chamberlain, Red Hook, N. Y., first prize, $15.
Carl Heyne, Red Hook, N. Y., second prize, $10.
Brunson & Mariner, East Bloomfield, N. Y., third prize, $5.

PENS OF (THREE) RAM LAMBS.

Carl Heyne, Red Hook N. Y., first prize, $10.
Wm. L. Chamberlain, Red Hook, N. Y., second prize, $5.

PENS OF (THREE) EWES OVER THREE YEARS OLD.

Wm. L. Chamberlain Red Hook, N. Y., first prize, $15.
Wm. L. Chamberlain, Red Hook, N. Y., second prize, $10.
Carl Heyne, Red Hook, N. Y., third prize, $5.

PENS OF (THREE) EWES TWO YEARS OLD.

Wm. L. Chamberlain, Red Hook, N. Y., first prize, $15.
Wm. L. Chamberlain, Red Hook, N. Y., second prize, $10.
Carl Heyne, Red Hook, N. Y., third prize, $5.

PENS OF (THREE) YEARLING EWES.

William L. Chamberlain, Red Hook, N. Y., first prize, $15.
William L. Chamberlain, Red Hook, N. Y., second prize, $10.
Carl Heyne, Red Hook, N. Y., third prize, $5.

PENS OF (THREE) EWE LAMBS.

William L. Chamberlain, Red Hook, N. Y., first prize, $10.
Carl Heyne, Red Hook, N. Y., second prize, $5.

MERINOS BRED FOR WEIGHT OF FLEECE—RAMS OVER TWO YEARS OLD.

Brunson & Mariner, East Bloomfield, N. Y., first prize, $15.
Ray Brothers, Honeoye, N. Y., second prize, $10; Middy's Boy, bred by exhibitors.
P. & G. F. Martin, Rush, N. Y., third prize, $5; bred by exhibitors.

YEARLING RAMS.

E. Townsend, Pavilion Centre, N. Y., first prize, $15; bred by exhibitors.
Ray Brothers, Honeoye, N. Y., second prize, $10; bred by exhibitors.
Brunson & Mariner, East Bloomfield, N. Y., third prize, $5.

PENS OF (THREE) RAM LAMBS.

P. & G. F. Martin, Rush, N. Y., first prize, $10; bred by exhibitors.
Brunson & Mariner, East Bloomfield, N. Y., second prize, $5.

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PENS OF (THREE) EWES OVER THREE YEARS OLD.

Ray Brothers, Honeoye, N. Y., first prize, $15; bred by exhibitors.
Brunson & Mariner, East Bloomfield, N. Y., second prize, $10.

PENS OF (THREE) EWES TWO YEARS OLD.

E. Townsend, Pavilion Centre, N. Y,, first prize, $15; bred by exhibitor.
Ray Brothers, Honeoye, N. Y., second prize, $10; bred by exhibitors.
P. & G. F. Martin, Rush, N. Y., third prize, $5; bred by exhibitors.

PENS OF (THREE) YEARLING EWES.

Brunson & Mariner, East Bloomfield, N. Y., first prize, $15.
E. Townsend, Pavilion Centre, N. Y., second prize, $10; bred by exhibitors.
P. & G. F. Martin, Rush, N. Y., third prize, $5; bred by exhibitors.

PENS OF (THREE) EWE LAMBS.

P. & G. F. Martin, Rush, N. Y., first prize, $10; bred by exhibitors.
Brunson & Mariner, East Bloomfield, N. Y., second prize, $5.

MERINOS BRED FOR LENGTH OF STAPLE (DELAINE WOOL)—RAMS OVER TWO YEARS OLD.

E. Townsend, Pavilion Centre, N. Y., first prize, $15; bred by exhibitor.
Pierce & Fellows, Spencerport, N. Y., second prize, $10.
M. F. Gibbs, Livonia, N. Y.; third prize, $5; bred by exhibitor.

YEARLING RAMS.

Brunson & Mariner, East Bloomfield, N. Y., first prize, $15.
E Townsend, Pavilion Centre, N. Y., second prize, $10; bred by exhibitor.
M. F. Gibbs, Livonia, N. Y., third prize, $5; bred by exhibitor.

PENS OF (THREE) RAM LAMBS.

M. F. & A. S. Gibbs, Livonia, N. Y., first prize, $15; bred by W. Cole and exhibitors.
E. Townsend, Pavilion Centre, N. Y., second prize, $10; bred by exhibitor.

PENS OF (THREE) YEARLING EWES.

E. Townsend, Pavilion Centre, N. Y., first prize, $15; bred by exhibitor.
Brunson & Mariner, East Bloomfield, N. Y., second prize, $10.
M. F. Gibbs, Livonia, N. Y., third prize, $5; bred by exhibitor and J. Goodrich.

PENS OF (THREE) EWE LAMBS.

E. Townsend, Pavilion Centre, N. Y., first prize, $10; bred by exhibitor.
J. C. Short, Hemlock Lake, N. Y., second prize, $5.

SWINE.

LARGE BREED—BOARS OVER TWO YEARS OLD.

A. L. Thomas, Cuba, N. Y., first prize, $15; improved Cheshire.
J. M. Thomas, Cuba, N. Y., second prize, $10; improved Cheshire.

BOARS ONE YEAR OLD.

A. L. Thomas, Cuba, N. Y., first prize, $15; improved Cheshire.
B. F. Tracy, Owego, N. Y., second prize, $10; Poland-China, bred by D. M. Magie.
Wm. M. Holmes, Greenwich, N. Y., third prize, $5; Prince, Duroc or improved red.

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BOARS OVER SIX AND LESS THAN TWELVE MONTHS OLD.

B. F. Tracy, Owego, N. Y., first prize, $15; Poland-China, bred by D. M. Magie.
A. L. Thomas, Cuba, N. Y., second prize, $10; improved Cheshire.

SOWS OVER TWO YEARS OLD.

A. L. Thomas, Cuba, N. Y., first prize, $15; improved Cheshire.
J. F. Camp, Apalachin, N. Y., second prize, $10; Poland-China, bred by exhibitor.

SOWS ONE YEAR OLD.

B. F. Tracy, Owego, N. Y., first prize, $15; Poland-China, bred by D. M. Magie.
J. M. Thomas, Cuba, N. Y., second prize, $10; improved Cheshire.

SOW PIGS OVER SIX AND LESS THAN TWELVE MONTHS OLD.

J. M. Thomas, Cuba, N. Y., first prize, $15; improved Cheshire.
J. F. Camp, Apalachin, N. Y., second prize, $10; Poland-China, bred by exhibitor.

PENS OF (FIVE) PIGS UNDER SIX MONTHS OLD.

A. L. Thomas, Cuba, N. Y , first prize, $15; improved Cheshire.
J. M. Thomas, Cuba, N. Y., second prize, $10; improved Cheshire.

SMALL WHITE BREED — BOARS OVER TWO YEARS OLD.

Joseph Featherston, Toronto, Canada, first prize, $15; Suffolk, bred by exhibitor.

BOARS ONE YEAR OLD.

Joseph Featherston, Toronto, Canada, first prize, $15; Suffolk, bred by exhibitor.
Joseph Featherston, Toronto, Canada, second prize, $10; Suffolk, bred by exhibitor.

BOARS OVER SIX AND LESS THAN TWELVE MONTHS OLD.

Joseph Featherston, Toronto, Canada, first prize, $15; Suffolk, bred by exhibitor.
J. M. Thomas, Cuba, N. Y., second prize, $10.

SOWS OVER TWO YEARS OLD.

Joseph Featherston, Toronto, Canada, first prize, $15; Suffolk, bred by exhibitor.

SOWS ONE YEAR OLD.

H. H. Ingersoll, Owego, N. Y., first prize, $15; Susie, bred by W. H. Cole.
Joseph Featherston, Toronto, Canada, second prize, $10; Suffolk, bred by exhibitor.

SOW PIGS OVER SIX AND LESS THAN TWELVE MONTHS OLD.

Joseph Featherston, Toronto, Canada, first prize, $15; Suffolk, bred by exhibitor.
Joseph Featherston, Toronto, Canada, second prize, $10; Suffolk, bred by exhibitor.

PENS OF (FIVE) PIGS UNDER SIX MONTHS OLD.

H. H. Ingersoll, Owego, N. Y., first prize, $15; bred by W. H. Cole.
J. M. Thomas, Cuba, N. Y., second prize, $10.

SMALL BLACK BREED — BOARS OVER TWO YEARS OLD.

Joseph Harris, Rochester, N, Y., first prize, $15; Marquis (Essex), bred by exhibitor

BOARS ONE YEAR OLD.

Joseph Featherston, Toronto, Canada, first prize. $15; Essex, bred by exhibitor.
Joseph Harris, Rochester, N. Y., second prize, $10; Essex, bred by exhibitor.

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BOAR PIGS OVER SIX AND LESS THAN TWELVE MONTHS OLD.

Joseph Featherston, Toronto, Canada, first prize, $15; Essex, bred by exhibitor.
Joseph Harris, Rochester, N. Y., second prize, $10; Edward Burnet (Essex), bred by exhibitor.

SOWS OVER TWO YEARS OLD.

Joseph Featherston, Toronto, Canada, first prize, $15; Essex, bred by exhibitor.
Joseph Harris, Rochester, N. Y., second prize, $10; Essex, bred by exhibitor.

SOWS ONE YEAR OLD.

Joseph Harris, Rochester, N. Y., first prize, $15; Essex, bred by exhibitor.
Joseph Featherston, Toronto, Canada, second prize, $10; Essex, bred by exhibitor.

SOW PIGS OVER SIX AND LESS THAN TWELVE MONTHS OLD.

Joseph Featherston, Toronto, Canada, first prize, $15; Essex, bred by exhibitor.
Joseph Featherston, Toronto, Canada, second prize, $10; Essex, bred by exhibitor.

PENS OF (FIVE) PIGS LESS THAN SIX MONTHS OLD.

Selah Mathews Harris, Rochester, N. Y., first prize, $15; Essex, bred by Joseph Harris.
Joseph Harris, Rochester, N. Y., second prize, $10; Essex, bred by exhibitor.

BERKSHIRE BOARS OVER TWO YEARS OLD.

William Newton, Henrietta, N. Y., first prize, $15.
Benjamin Fellows, Clifton, N. Y., second prize, $10; Black Prince, bred by exhibitor, farrowed November 18, 1874, sire Prince of Bowmanville 301, dam Primrose by 303 M., gr. d. by Idstone.

BOARS ONE YEAR OLD.

A. G. Barlow & Co, North Ridgeway, N. Y., first prize, $15; Hillside Prince, bred by Heber Humfrey, sire Lineal Baronet, dam Lady Hillside by 455 M.
C. S. Wyckoff, Cuba, N. Y., second prize, $10; Prairie Diamond.

BOAR PIGS OVER SIX AND LESS THAN TWELVE MONTHS OLD.

C. S. Wyckoff, Cuba, N. Y., first prize, $15; sire Prairie Diamond, dam Maggie 2nd.
H. Bowen, Medina, N. Y., second prize, $10; Sambo IX, Jr., bred by William Smith, Michigan, farrowed October 24, 1876, sire Sambo IX, dam Susie, gr. d. Maid of Oxford.

SOWS OVER TWO YEARS OLD.

Benjamin Fellows, Clifton, N. Y., first prize, $15; Primrose 4th, bred by R. D. Foley, Bowmanville, Canada, farrowed April 22, 1874, sire England's Glory, dam Primrose by 303 M., gr. d. by Idstone.
C. S. Wyckoff, Cuba, N. Y., second prize, $10; Maggie, sire bred by A. M. Farley, dam Biddie 2nd.

SOWS ONE YEAR OLD.

P. & G. F. Martin, Rush, N. Y., first prize, $15; bred by exhibitors.
H. Bowen, Medina, N. Y., second prize, $10; Hambrook Beauty 2nd, sire Sambo IX, imported, dam Hambrook Beauty, gr. d. B.

SOW PIGS OVER SIX AND UNDER TWELVE MONTHS OLD.

P. & G. Martin, Rush, N. Y., first prize, $15.
C. S. Wyckoff, Cuba, N. Y,, second prize, $10; sire Prairie Diamond, dam Maggie 2nd.

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PENS OF (FIVE) PIGS UNDER SIX MONTHS OLD.

A. G. Barlow & Co., North Ridgeway, N. Y., first prize, $15; bred by exhibitors, 5½ months, sire Hillside Prince, dam Empress Lady by Wharfdale Chief.

C. S. Wyckoff, Cuba, N. Y., second prize, $10: sire Prince Diamond, dam Maggie 2nd.

POULTRY.

COLLECTIONS OF PURE-BRED POULTRY.

O. Howland & Son, Auburn, N. Y., silver medal.

TRIOS LIGHT BRAHMAS.

C. S. Smith, Cuba, N. Y., second prize, $3.

TRIOS OF DARK BRAHMAS.

William H. Duel, Toronto, Canada, first prize, $5.

TRIOS OF BUFF, LEMON, OR CINNAMON COCHINS.

O. E. Hayden, Rochester, N. Y., first prize, $5.

O. E. Hayden, Rochester, N. Y., second prize, $3.

TRIOS OF PARTRIDGE OR GROUSE COCHINS.

O. Howland & Son, Auburn, N. Y., first prize, $5.

John Prince, Spencerport, N. Y., second prize, $3.

TRIOS OF WHITE COCHINS.

T. C. Stanton, Rochester, N. Y., first prize, $5.

TRIOS OF COLORED DORKINGS.

G. H. Warner, New York Mills, N. Y., first prize, $5.

TRIOS OF SILVER-GRAY DORKINGS.

G. H. Warner, New York Mills, N. Y., second prize, $3.

TRIOS OF GOLDEN SPANGLED HAMBURGHS.

Newton Adams, Utica, N. Y., first prize, $5.

L. D. Ely, Jr., Rochester, N. Y., second prize, $3.

TRIOS OF SILVER SPANGLED HAMBURGHS.

L. D. Ely, Jr., Rochester, N. Y., first prize, $5.

Newton Adams, Utica, N. Y., second prize, $3.

TRIOS OF GOLDEN PENCILED-HAMBURGHS.

L. D. Ely, Jr., Rochester N. Y., first prize, $5.

TRIOS OF SILVER-PENCILED HAMBURGHS.

Newton Adams, Utica, N. Y., first prize, $5.

Newton Adams, Utica, N. Y., second prize, $3.

TRIOS OF BLACK HAMBURGHS.

Newton Adams, Utica, N. Y., first prize, $5.

TRIOS OF BLACK SPANISH.

William Morris Wendell, Albany, N. Y., first prize, $5.

TRIOS OF WHITE LEGHORNS (YELLOW LEGS, SINGLE COMBS).

L. D. Ely, Jr., Rochester, N. Y., first prize, $5.

O. E. Hayden, Rochester, N. Y., second prize, $3.

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TRIOS OF BROWN LEGHORNS.

T. C. Stanton, Rochester, N. Y., first prize, $5.
Edwin T. Marsh, Rochester, N. Y., second prize, $3.

TRIOS OF PLYMOUTH ROCKS.

L. D. Ely, Jr., Rochester, N. Y., first prize, $5.
O. Howland & Son, Auburn, N. Y., second prize, $3.

TRIOS OF HOUDANS.

C. D. Cartwright & Co., Fairport, N. Y., first prize, $5.
John W. McHarg, Albany, N. Y., second prizce, $3.

TRIOS OF BLACK POLISH.

C. D. Cartwright & Co., Fairport, N. Y., first prize, $5.

TRIOS OTHER POLISH.

C. D. Cartwright & Co., Fairport, N. Y., first prize, $5; bearded silver.
O. Howland & Son, Auburn, N. Y., second prize, $3.

EXTRA AWARDS.

C. D. Cartwright, Fairport, N. Y., bearded golden Polish, $5.
C. D. Cartwright, Fairport, N. Y., plain golden Polish, $5.

PAIRS BLACK-BREASTED RED GAMES.

John Hope, Millbrook, N. Y., first prize, $5.
J. C. Halloran, Rochester, N. Y., second prize, $3.

PAIRS OF BROWN-BREASTED RED GAMES.

John Hope, Millbrook, N. Y., first prize, $5.
W. J. Rogers, Rochester, N. Y., second prize, $3.

PAIRS OF DUCKWING GAMES.

William Morris Wendell, Albany, N. Y., first prize, $5.

PAIRS OF IRISH-GRAY OR SHAWL-NECK GAMES.

J. C. Halloran, Rochester, N. Y., first prize, $5.

PAIRS OF PILE GAMES.

Worcester, Heyne & Trimmer, Rochester, N. Y., first prize, $5; yellow-legged Piles.
William Morris Wendell, Albany, N. Y., second prize, $3.

PAIRS OF OTHER APPROVED WELL-BRED GAMES.

John Hope, Milbrook, N. Y., first prize, $5.

PAIRS OF RED GAME BANTAMS.

T. C. Stanton, Rochester, N. Y., first prize, $5.
G. H. Warner, New York Mills, N. Y., second prize, $3.

PAIRS OF PILE GAME BANTAMS.

Otto W. Volger, Buffalo, N. Y., first prize, $5; red.
J. A. Witzel, Rochester, N. Y., second prize, $3.

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PAIRS OF DUCKWING GAME BANTAMS.

Otto W. Volger, Buffalo, N. Y., first prize, $5; yellow.
T. C. Stanton, Rochester, N. Y., second prize, $3.

TRIOS OF GOLD-LACED SEBRIGHT BANTAMS.

Worcester, Heyne & Trimmer, Rochester, N. Y., first prize, $5.
G. H. Warner, New York Mills, N. Y., second prize, $3.

TRIOS OF BLACK BANTAMS.

T. C. Stanton, Rochester, N. Y., first prize, $5; black African, rose combs.

TRIOS OF OTHER BANTAMS.

W. J. Marson, Rochester, N. Y., first prize, $5; white game Bantams.
Henry A. King, Rochester, N. Y., second prize, $3; white feather-legged Bantams.

PAIRS OF BRONZE TURKEYS.

O. Howland & Son, Auburn, N. Y., first prize, $5.
L. D. Ely, Jr., Rochester, N. Y., second prize, $3.

PAIRS OF WHITE TURKEYS.

O. Howland & Son, Auburn, N. Y., second prize, $3

PAIRS OF BUFF TURKEYS.

O. Howland & Son, Auburn, N. Y., second prize, $3.

PAIRS OF GRAY OR NARRAGANSET TURKEYS.

C. L. G. Blessing, Slingerlands, N. Y., first prize, $5.

PAIRS OF BLACK TURKEYS.

O. Howland & Son, Auburn, N. Y., first prize, $5.
C. L. G. Blessing, Slingerlands, N. Y., second prize, $3.

PAIRS OF TOULOUSE GEESE.

A. G. Barlow & Co., North Ridgeway, N. Y., first prize, $5.

PAIRS OF BREMEN GEESE.

O. Howland & Son, Auburn, N. Y., first prize, $5.
Frederick Fellows, Clifton, N. Y., second prize, $3.

PAIRS OF WHITE CHINA GEESE.

O. Howland & Son, Auburn, N. Y., first prize, $5.

PAIRS OF WILD GEESE.

O. Howland & Son, Auburn, N. Y., first prize, $5.

PAIRS OF ROUEN DUCKS.

O. Howland & Son, Auburn, N. Y., first prize, $5.
Wm. H. Duel, Toronto, Canada, second prize, $3.

PAIRS OF AYLESBURY DUCKS.

C. D. Cartwright & Co., Fairport, N. Y., second prize, $3.

PAIRS OF CAYUGA DUCKS.

O. Howland & Son, Auburn, N. Y., first prize, $5.

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PAIRS OF MUSK OR MUSCOVY DUCKS.

William Morris Wendell, Albany, N. Y., first prize, $5.

PAIRS OF PEKIN DUCKS.

George H. Osgoodsby, Pittsford, N. Y., first prize, $5.
George H. Osgoodsby, Pittsford, N. Y., second prize, $3.

PAIRS OF KANAKA DUCKS.

Mrs. Thomas Frothingham, Rochester, N. Y., first prize, $5.

PIGEONS — PAIRS OF POUTERS.

J. A. Witzel, Rochester, N. Y., first prize, $3.
J. A. Witzel, Rochester, N. Y., second prize, $2.

PAIRS OF CARRIERS.

J. A. Witzel, Rochester, N. Y., first prize, $3.

PAIRS OF TUMBLERS (SHORT-FACED).

J. A. Witzel, Rochester, N. Y., first prize, $3.

PAIRS OF BARBS.

J. A. Witzel, Rochester, N. Y., first prize, $3

PAIRS OF TURBITS (SOLID COLOR).

T. C. Stanton, Rochester, N. Y., first prize, $3.

PAIRS OF TURBITS (WINGED).

J. A. Witzel, Rochester, N. Y., first prize, $3.
T. C. Stanton, Rochester, N. Y., second prize, $2.

PAIRS OF OWLS (SOLID COLOR).

J. A. Witzel, Rochester, N. Y., first prize, $3.
T. C. Stanton, Rochester, N. Y., second prize, $2.

PAIRS OF OWLS (WINGED).

T. C. Stanton, Rochester, N. Y., first prize, $3.
T. C. Stanton, Rochester, N. Y., second prize, $2.

PAIRS OF SHAKING FANTAILS.

C. D. Cartwright & Co., Fairport, N. Y., first prize, $3.
C. D. Cartwright & Co., Fairport, N. Y., second prize, $2.

PAIRS OF JACOBINS.

J. A. Witzel, Rochester, N. Y., first prize, $3.

PAIRS OF BLUE ROCKS.

T. C. Stanton, Rochester, N. Y., second prize, $3.

PAIRS OF DRAGOONS.

T. C. Stanton, Rochester, N. Y., first prize, $3.

PAIRS OF ANTWERPS.

T. C. Stanton, Rochester, N. Y., first prize, $3.

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COLLECTIONS OF FANCY PIGEONS.

Charles J. Brown, Rochester, N. Y., first prize, $5.

COMMON RABBITS — BUCKS.

J. A. Witzel, Rochester, N. Y., first prize, $2.
William Morris Wendell, Albany, N. Y., second prize, $1.

DOES.

J. A. Witzel, Rochester, N. Y., first prize, $2.
William Morris Wendell, Albany, N. Y., second prize, $1.

ARTIFICIAL MOTHER.

T. C. Stanton, Rochester, N. Y., second prize, $5.

IMPLEMENTS AND MACHINERY.

STATIONARY STEAM ENGINES.

Woodbury, Booth & Pryor, Rochester, N. Y., bronze medal; automatic cut-off steam engine, cylinder 10x15, 4,500 pounds, $765.

POTATO DIGGERS.

G. W. Kintz, West Brighton, N. Y., certificate of high merit; combined bean cutter and potato digger, 175 pounds, $30.

M. B. Riggs, Palmyra, N. Y., certificate of merit; Riggs' potato digger, 250 pounds, $40.

PLOUGHS AND ATTACHMENTS TO PLOUGHS.

Gale Manufacturing Co., Albion, Mich., certificate of high merit; Gale's chilled Ploughs, No. 15, three-horse plough, 160 pounds, $17; No. 22, two-horse plough, 150 pounds, $16.50; No. 18, two-horse plough, 145 pounds, $16; No. 20, light, two-horse, $15.50; No. 17, one-horse, 75 pounds, $9.

Lawrence & Chapin, Kalamazoo, Mich., certificate of high merit; Diamond iron plough, No. 5, 100 pounds, $18; jointer and wheel on same, $3.50; one coulter, No. 3, 90 pounds, $12; with wheel and coulter attached, $2.50; No. 1, 60 pounds, $8.50; No. 2, 90 pounds, $12; No. 4, 90 pounds, $13.

Robinson Chilled Plow Co., Syracuse, N. Y., certificate of high merit; chilled plough, No. 0, 70 pounds, $10; No. 1, 155 pounds, $16; No. 2, 130 pounds, $16; No. 10, 173 pounds, $18; No. 20, 147 pounds, $16; No. 1, three-horse, 155 pounds, $17.

Wiard Plow Co., Batavia, N. Y., certificate of high merit; combination wood beam plough, two or three-horse, 150 pounds, $15.50; same, malleable iron beam, 150 pounds, $16.50.

Wiard Plow Co., Batavia, N. Y., certificate of high merit; iron beam, light two-horse plough, 130 pounds, $14; medium, 140 pounds, $14.50; heavy, 150 pounds, $15; three-horse, light, 155 pounds, $15.50; heavy, 165 pounds, $16.50.

Wiard Plow Co., Batavia, N. Y., certificate of high merit; one-horse wood beam plough, 70 pounds, $8.

HAY LOADERS AND CARRIERS.

Stratton & Cullum, Meadville, Pa., bronze medal; Foust's hay loader, for pitching hay, barley and all loose grain into waggon in the field, 550 pounds, 12½ feet by eight feet, $85.

G. Van Sickler, Shortsville, N. Y., certificate of high merit; hay car, for conveying hay in barn, 25 pounds, $12; track erected $30; slings, per set, $6.

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J. R. Fitzhugh, Philadelphia, Pa., certificate of merit; Fitzhugh's American hay elevator, made of malleable iron and triangular in form, twelve pounds, $12.

W. G. Ricker, Rochester, N. Y., certificate of merit; Excelsior hay carrier and slings, $35.

POWERS OTHER THAN STEAM..

William Smith & Co., Kalamazoo, Mich., certificate of high merit; self-regulating wind engine, 600 pounds, $120.

Mast, Foos & Co., Springfield, Ohio, certificate of merit; iron turbine wind engine, for pumping water, 400 pounds, $100.

MISCELLANEOUS.

John Bartholf, Rochester, N. Y., certificate of merit; tilting gate for farm use.

C. T. Bush, Maryland, N. Y., certificate of high merit; iron fence, 23 pounds to the foot, $1 per foot.

Ezra Jones & Son, Rochester N. Y., bronze medal; Centennial water wheel, 36 inch diameter, 975 pounds, $250.

J. A. Lafler, Albion, N. Y., certificate of merit; iron-clad brick machine, $500, with specimens of brick.

G. E. Sherry, Rochester, N. Y., certificate of high merit; earth auger, 150 pounds, $100; also derrick for operating, 800 pounds, $100.

H. B. Osgood, Binghamton, N. Y., bronze medal; Osgood's patent combination hay and cattle scales, four ton, $40, five ton, $45, six ton, $50, eight ton, $65, ten ton, $75.

FANNING MILLS

S. B. Van Duzer & Co., Gouverneur, N. Y., bronze medal; Bonanza fanning mill, 190 pounds, $45.

GRAIN SEPARATING AND ASSORTING MACHINES.

E. F. Crofut & Co., Syracuse, N. Y., certificate of high merit; Osborne's patent grain and seed cleaner, 160 pounds, $35.

S. B. Van Duzer & Co., Gouverneur, N. Y., bronze medal; Bonanza machine for separating mixtures of grain, cleaning and assorting ditto, 190 pounds, $50.

FLAX SEED CLEANERS.

S. B. Van Duzer & Co., Gouverneur, N. Y., bronze medal; Bonanza flax seed cleaner, 190 pounds, $40.

POWER FEED OR CHAFF CUTTERS.

Ayr Agricultural Works, Ayr, Ontario, Canada, bronze medal; power straw and feed cutter, three knives, reverse, stop and start motion, with carriers for elevating feed after being cut, $60, gold.

HAND FEED OR CHAFF CUTTERS.

Ayr Agricultural Works, Ayr, Ontario, Canada, certificate of high merit; $20, gold.

George Parnell & Son, Ontario, N. Y., bronze medal; 200 pounds, $25.

HAND CORN-SHELLERS.

Tiernan & Green, Ithaca, N. Y., bronze medal; Cornell's patent, double tube, 178 pounds, $16.

CIDER MILLS AND PRESSES, POWER MACHINES.

Boomer & Boschert Press Co., Syracuse, N. Y., bronze medal; cider press with power attachment and double platform, 2,800 pounds, $230.

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Boomer & Boschert Press Co., Syracuse, N. Y., certificate of high merit; apple grater with pomace vat, 400 pounds, $80.

CIDER MILLS AND PRESSES COMBINED.

P .P. Mast & Co., Springfield, Ohio, bronze medal; Senior cider mill, two tubs, 400 pounds, $40.

J. Schoepflin, Gardenville, N. Y., bronze medal; self-presser, Junior cider mill and press combined, hand power, 230 pounds, $40.

HAND AND POWER PRESSES.

P. K. Dederick, Albany, N. Y., bronze medal; perpetual hay press, $300 to $500.

ROOT CUTTERS.

Ayr Agricultural Works, Ayr, Ontario, Canada, bronze medal; double-acting root cutter, $32, gold.

ROOT PULPERS.

Ayr Agricultural Works, Ayr, Ontario, Canada, bronze medal; $45, gold.

PUMPS FOR FARM USE.

James D. Shoots, Horseheads, N. Y., bronze medal; rubber valve chain pump for farm or house, 120 pounds, first ten feet $10, each subsequent foot, 40 cents.

T. W. Shaw, Rochester, N. Y., certificate of merit.

Westfall & Denny, Buffalo, N. Y., certificate of merit; Genesee Valley force pump, for well pumps, wind-mills, slip pumps, lawn and garden engines, non-freezing, double-acting. No. 1, single, $12; No. 2, single, $15; No. 1, double, $20.

WASHING MACHINES.

Jacob J. Bubser, Rochester, N. Y., bronze medal; Allison's patent wash tub, prices from $6 to $10.

Charles A. Daniels, Waterville, N. Y., certificate of high merit; 12½ pounds, 31x13 inches, $5.

George W. Rowell & Co., Ogdensburgh, N. Y., certificate of merit; Howell steam washer, for exhibition only, $10.

John W. Vogel, Rochester, N. Y., certificate of high merit; The Triumph.

CLOTHES WRINGERS.

G. G. Curtis, Rochester, N. Y., bronze medal; Little Hero, $6.

WOOD WORKING MACHINERY — PLANING AND MATCHING MACHINES

J. S. Graham & Co., Rochester, N. Y., bronze medal; 4,000 pounds, $600.

SURFACE PLANING MACHINES.

J. S. Graham & Co., Rochester, N. Y., bronze medal; 800 pounds, $150.

MOULDING MACHINES.

Connell & Dengler, Rochester, N. Y,, bronze medal; variety moulder $225.

RE-SAWING MACHINES.

Connell & Dengler, Rochester, N. Y., bronze medal; combined rip and cross-cut sawing machine, 1,300 pounds, $200.

STEAM SCROLL SAWING MACHINES.

Connell & Dengler, Rochester, N. Y., bronze medal; band scroll sawing machine, 1,500 pounds, $250.

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HAND SCROLL SAWING MACHINES.

Lewis Brothers, Seneca Falls, N. Y., bronze medal; scroll sawing machines for sawing brackets, screens, book-shelves, photograph frames, stands, fancy boxes, etc., 50 pounds, $20 to $35.

EXTRA ENTRIES.

J. S. Graham & Co., Rochester, N. Y., certificate of high merit; hand matching machine, 800 pounds, $150.

James Hazard, Rochester, N. Y., certificate of merit; stave jointer operated by foot-power, $100.

Jerome W. Moseley, Syracuse, N. Y., certificate of high merit; novelty boring machine, 600 pounds, $125 to $150.

DAIRY IMPLEMENTS — CHURNS FOR LARGE DAIRIES.

T. A. Cubitt, Brockport, N. Y., bronze medal; T. A. Cubitt's double-acting dasher, 26 pounds, $5.50 and $6.

MILK PANS FOR CREAMERIES.

Hughs, Pierce & Co., Rodman, N. Y., bronze medal; set of fifteen-cow American milk pans, $80.

COOPERS' WORK.

Brown & Robinson, Rochester, N. Y., bronze medal; specimens of coopers' work, ½ bbl. (pork) $2.50; bbl. $3; churns, $2.25, $2.75, $3.25; ½ bbl. for ale, $2.75; ¼ bbl. for ale, $2.38; 10 gal. keg, $1.50; 5 gal. keg, $1.25; horse foot tub, $3.

James Hazard, Rochester, N. Y., bronze medal; Hazard's patent ventilated fruit and vegetable barrels.

EXHIBITIONS OF FARM AND GARDEN TOOLS AND IMPLEMENTS.

McBride & True, Rochester, N. Y., bronze medal.

EXTRA ENTRIES.

E. Ruhlmann, Lockport, N. Y., certificate of merit; Ruhlmann's combined wheel hoe for cultivating garden stuff planted in rows, 21 pounds, $5.

Saxton & Amidon, Buffalo, N. Y., certificate of high merit; Amidon's patent bit brace.

Saxton & Amidon, Buffalo, N. Y., certificate of high merit; Amidon's patent brace wrench.

WAGGONS, CARRIAGES, SADDLERY AND ARTICLES OF WHEELWRIGHTS' AND BLACKSMITHS' WORK.

ROCKAWAYS.

Cortland Wagon Co., Cortland, N. Y., bronze medal; platform spring, gipsy top, four seats, 400 pounds, $180.

PARK PHÆTONS.

Cortland Wagon Co., Cortland, N. Y., bronze medal; platform spring, four seats, 400 pounds, $250.

ROAD WAGGONS — FOUR SEATS.

Cortland Wagon Co., Cortland, N. Y., bronze medal; platform spring, four seats, 450 pounds, $110.

OPEN WAGGONS — TWO SEATS.

George G. Bown, Fairport, N. Y., bronze medal; 875 pounds, $175.

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Wm. Foote, Fillmore, N. Y., bronze medal; light patent side spring buggy, 190 pounds, $120.

BUSINESS WAGGONS.

Watertown Spring Wagon Co., Watertown, N. Y., bronze medal; heavy market waggon with platform springs.

Watertown Spring Wagon Co., Watertown, N. Y., bronze medal; light market waggon with platform springs.

DOUBLE FARM WAGGONS.

H. W. Marcellus, Rochester, N. Y., bronze medal; Mitchell farm wagons, 3¼ inch skein, 1,000 pounds, $75; 3¼ inch skein, 1,050 pounds, $80; 2 inch skein, iron axle, 1,200 pounds, $90.

ASSORTMENT OF WAGGON WOOD WORKS.

Wm. Corris & Co., Rochester, N Y., bronze medal.

EXTRA ENTRIES.

Cornell & Horne, Skaneateles, N. Y., certificate of high merit; swell cutter wood work, fifty pounds, $17.

Wm. Corris & Co., Rochester, N. Y., bronze medal; exhibition of carriage wheels.

Erie Torsion Spring Co., Spencerport, N. Y., certificate of high merit; Torsion wagon springs, price per set to carry 1,000 pounds, $9, and $1 additional for each 500 pounds up to 8,000 pounds; seat springs, $3.75; pole springs, $3 and $3.25.

FARM PRODUCE.

GRAIN, SEEDS, HOPS, GROWN IN 1877 — WHITE WINTER WHEAT.

H. J. Kent, Palmyra, N. Y., first prize, $10.

Nathan Case, Egypt, N. Y., second prize, $5.

SPRING WHEAT.

A. R. Ketchum, Perinton, N. Y., first prize, $10.

George H. Lee, Rochester, N. Y., second prize, $5.

WHITE OATS.

Edwin Van Allen, Bethlehem, N. Y., first prize, $10.

J. M. Thomas, Cuba, N. Y., second prize, $5.

BLACK OR GRAY OATS.

Edwin Van Allen, Bethlehem, N. Y., second prize, $5.

TWO-ROWED SPRING BARLEY.

J. M. Thomas, Cuba, N. Y., first prize, $10.

A. L. Thomas, Cuba, N. Y., second prize, $5.

FOUR-ROWED SPRING BARLEY.

Arch. McCartney, Gates, N. Y., first prize, $10.

Jesse Fowler, Henrietta, N. Y., second prize, $5.

YELLOW INDIAN CORN (SHELLED).

John H. Osgoodsby, Pittsford, N. Y., first prize, $10.

H. J. Kent, Palmyra, N. Y., second prize, $5.

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WHITE INDIAN CORN (SHELLED).

Edwin Van Allen, Bethlehem, N. Y., second prize, $5.

FIELD BEANS (LARGE).

H. J. Kent, Palmyra, N. Y., first prize, $10.
Arch. McCartney, Gates, N. Y., second prize, $5.

FIELD BEANS (SMALL).

W. P. Ottley, Phelps, N. Y., first prize, $10.
H. J. Kent, Palmyra, N. Y., second prize, $5.

FIELD PEAS (LARGE).

J. M. Thomas, Cuba, N. Y., first prize, $10.

FIELD PEAS (SMALL).

Edwin Van Allen, Bethlehem, N. Y., second prize, $5.

BUCKWHEAT.

George H. Lee, Rochester, N. Y., first prize, $5.
C. L. G. Blessing, Slingerlands, N. Y., second prize, $3.

TWENTY-FIVE SEED EARS YELLOW CORN, EIGHT ROWED.

Wm. Newton, Henrietta, N. Y., first prize, $5.
John Hope, Millbrook, N. Y., second prize, $3.

TWENTY-FIVE SEED EARS YELLOW CORN, TWELVE ROWED.

Edwin Van Allen, Bethlehem, N. Y., first prize, $5.
John O'Reilly, Greece, N. Y., second prize, $3.

TWENTY-FIVE SEED EARS WHITE CORN.

A. S. Johnson, Chili, N. Y., first prize, $5.
Edwin Van Allen, Bethlehem, N. Y., second prize, $3.

TWENTY-FIVE EARS EARLY SWEET CORN.

S. B. Paine, Pittsford, N. Y., first prize, $5.
Edwin Van Allen, Bethlehem, N. Y., second prize, $3.

TWENTY-FIVE EARS LATE SWEET CORN.

C. C. Holton, Rochester, N. Y., first prize, $5.
Edwin Van Allen, Bethlehem, N. Y., second prize, $3.

BALE OF HOPS, 100 POUNDS OR OVER.

John H. Osgoodsby, Pittsford, N. Y., first prize, $10.
Nathan English, Greece, N. Y., second prize, $5.

VEGETABLES.

SIX ROOTS OF CELERY.

George Cooper, Rochester, N. Y., first prize, $3.
A. S. Johnson, Chili, N. Y., second prize, $2.

SIX CAULIFLOWERS.

George Cooper, Rochester, N. Y., first prize, $3.
John O'Reilly, Greece, N. Y., second prize, $2.

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CABBAGES.

George Cooper, Rochester, N. Y., first prize, $3.

THREE HEADS OF LETTUCE.

George Cooper, Rochester, N. Y., first prize, $3.
John O'Reilly, Greece, N. Y., second prize, $2.

TURNIPS.

George Cooper, Rochester, N. Y., second prize, $2.

MANGOLDS.

A. S. Johnson, Chili, N. Y., first prize, $3.
John Hope, Millbrook, N. Y., second prize, $2.

BEETS.

George Cooper, Rochester, N. Y., first prize, $3.

TWELVE ORANGE CARROTS.

George Cooper, Rochester, N. Y., first prize, $3.
John O'Reilly, Greece, N. Y., second prize, $2.

TWELVE WHITE CARROTS.

Samuel Ellis, Alfred Centre, N. Y., second prize, $2.

TWELVE PARSNIPS.

George Cooper, Rochester, N. Y., first prize, $3.
John O'Reilly, Greece, N. Y., second prize, $2.

TWELVE ROOTS OF SALSIFY.

George Cooper, Rochester, N. Y., first prize, $3.
A. S. Johnson, Chili, N. Y., second prize, $2.

TWELVE KOHL-RABI.

A. S Johnson, Chili, N. Y., first prize, $3.
George Cooper, Rochester, N. Y., second prize, $2.

ONIONS.

A. S. Johnson, Chill, N. Y., second prize, $2.

TOMATOS.

George Cooper, Rochester, N. Y., second prize, $2.

SIX EGG PLANTS.

George Cooper, Rochester, N. Y., first prize, $3.
John O'Reilly, Greece, N. Y., second prize, $2.

GARDEN BEANS.

A. S. Johnson, Chili, N. Y., first prize, $3.
Edwin Van Allen, Bethlehem, N. Y., second prize, $2.

PEPPERS.

George Cooper, Rochester, N. Y., second prize, $2.

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SQUASHES.

John O'Reilly, Greece, N. Y., first prize, $3.
S. B. Paine, Pittsford, N. Y., second prize, $2.

FIELD PUMPKINS.

A. S. Johnson, Chili, N. Y., second prize, $2.

COLLECTIONS OF EARLY POTATOES.

C. L. G. Blessing, Slingerlands, N. Y., first prize, $10.
A. S. Johnson, Chili, N. Y., second prize, $5.

COLLECTIONS OF LATE POTATOES.

A. S. Johnson, Chili, N. Y., first prize, $10.
C. L. G. Blessing, Slingerlands, N. Y., second prize, $5.

COLLECTIONS OF POTATOES — STOCK-FEEDING VARIETIES.

J. F. Tillinghast, La Plume, Penn., first prize, $10.
A. S. Johnson, Chili, N. Y., second prize, $4.

BUTTER.

PACKAGES OF NOT LESS THAN THIRTY POUNDS NET, MADE IN JUNE.

Mrs. C. L. Douglass, Reed's Corners, N. Y., third prize, $10.

PACKAGES OF NOT LESS THAN THIRTY POUNDS NET, MADE AT ANY TIME.

Mrs. Morgan Decker, Owego, N. Y., third prize, $10.

SAMPLES OF NOT LESS THAN FIVE POUNDS IN ONE-POUND ROLLS.

Mrs. C. L. Douglass, Reed's Corners, N. Y., third prize, $5.

CHEESE.

AMERICAN CHEESE OF THE USUAL CHARACTER AND SHAPE, FACTORY OR OTHER, OVER ONE YEAR OLD, NOT LESS THAN TWENTY POUNDS WEIGHT.

Seth Bonfoy, West Winfield, N. Y., first prize, $20.
J. G. Cohoe, Fredonia, N. Y., second prize, $15.

FIVE IMITATION ENGLISH CHEESES.

J. G. Cohoe, Fredonia, N. Y., second prize, $5.

IMITATION OF STILTON CHEESE.

J. G. Cohoe, Fredonia, N. Y., second prize, $5.

THREE PREPARED RENNETS.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $10.
J. G. Cohoe, Fredonia, N. Y., second prize, $5.

BREAD, SUGAR, ETC.

WHEATEN BREAD.

Miss Bertha Carrington, Rochester, N. Y., first prize, $5, (Made by a girl 13 years of age.)
F. W. Collins, Rochester, N. Y., second prize, $3.

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RYE BREAD.

Mrs. W. H. Graves, Blossvale, N..Y., first prize, $5.
Mrs. Marilla Hovey, Rochester, N. Y., second prize, $3.

INDIAN, OR RYE AND INDIAN BREAD.

Jesse Fowler, Henrietta, N. Y., first prize, $5.
C. L. G. Blessing, Slingerlands, N. Y., second prize, $3.

MAPLE SUGAR, 25 POUNDS.

P. Miller, Fredonia, N. Y., second prize, $3.

MAPLE SYRUP, ONE GALLON.

Solomon A. Dewey, Walworth, N. Y., first prize, $5.
Mrs. W. H. Graves; Blossvale, N. Y., second prize, $3

PRESERVED FRESH FRUITS.

Mrs. Marilla Hovey, Rochester, N. Y., first prize, $5. (Jellies.)
John Stryker, Rome, N. Y., second prize, $3.

PICKLES IN VINEGAR.

Mrs. Marilla Hovey, Rochester, N. Y., first prize, $5.
F. W. Collins, Rochester, N. Y., second prize, $3.

DRIED APPLES HALF BUSHEL.

Ira B. Crandall, Alfred Centre, N. Y., second prize $3.

DRIED PEACHES, HALF-BUSHEL.

Mrs. C. M. Stone, Blossvale, N. Y., second prize, $3.

DRIED WHORTLEBERRIES, ONE PECK

Mrs. Wm. H. Graves, Blossvale, N. Y., second prize, $3.

DRIED RASPBERRIES, ONE PECK.

Solomon A. Dewey, Walworth, N. Y., first prize, $5.
Mrs. Wm. H. Graves, Blossvale, N. Y., second prize, $3.

SAMPLES OF BOX HONEY, TEN POUNDS.

C. P. Alverson, Pittsford, N. Y., first prize, $5.
P. Miller, Fredonia, N. Y., second prize, $3.

DOMESTIC MANUFACTURES.

PAIRS OF WOOLEN BLANKETS.

Mrs. D. C. Besse, Stanwix, N. Y., first prize, $5.

ALL-WOOL HORSE BLANKETS.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $5.
Mrs. W. H. Graves, Blossvale, N. Y., second prize, $3.

TEN YARDS WOOLEN CLOTH.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $5.

TEN YARDS WOOLEN FLANNEL.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $5.
Mrs. W. H. Graves, Blossvale, N. Y., second prize, $3.

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TEN YARDS FLANNEL, COTTON WARP.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $5.
Mrs. W. H. Graves, Blossvale, N. Y., second prize, $3.

TEN YARDS LINSEY-WOOLSEY.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $5.

TEN YARDS COTTON AND WOOL KERSEY.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $5.

TEN YARDS WOOLEN CARPET.

Mrs. D. C. Besse, Stanwix, N. Y., first prize, $5.

TEN YARDS RAG CARPET.

Mrs. J. G. Patterson, West Henrietta, N. Y., first prize, $5.
Miss F. E. Cook, Coldwater, N. Y., second prize, $3.

HEARTH RUGS.

Mrs. Marilla Hovey, Rochester, N. Y., first prize, $5.
Mrs. C. L. Douglass, Reed's Corners, N. Y., second prize, $3.
Mrs. C. M. Stone, Blossvale, N. Y., rug made of rags, $5.

DOUBLE CARPET COVERLETS.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $5.

TEN YARDS LINEN CLOTH.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $5.

TEN YARDS LINEN DIAPER.

Mrs. D. C. Besse, Stanwix, N. Y., first prize, $5.

TEN YARDS LINEN BAGGING,

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $5.

KNIT BED SPREADS.

A. S. Johnson, Chili, N. Y., first prize, $3.
Miss Josephine Houck, Rochester, N. Y., second prize, $2.

WHITE-WORKED OR QUILTED BED SPREADS.

A. S. Johnson, Chili, N. Y., first prize, $3.
Edwin Van Allen, Bethlehem, N. Y., second prize, $2.

SILK PATCH-WORK QUILT.

Mrs. R. A. Shedd, Honeoye Falls, N. Y., $3.

BALMORAL PETTICOATS.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $3.
Mrs. C. M. Stone, Blossvale, N. Y., second prize, $2.

WOOLEN KNIT STOCKINGS.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $3.
Mrs. C. L. Douglass, Reed's Corners, N. Y., second prize, $2.

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Woolen Knit Mittens.

Mrs. Marilla Hovey, Rochester, N. Y., first prize, $3.
Mrs. C. M. Stone, Blossvale, N. Y., second prize, $2.

Woolen Fringe Mittens.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $3.

Linen or Cotton Knit Stockings.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $3.
Mrs. Mary Houck, Rochester, N. Y., second prize, $2.

Pound of Linen Sewing Thread.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $3.

FLOWERS.

Professional List.— Exhibitions of Cut Flowers.

James Vick, Rochester, N. Y., first prize, $10.

Exhibitions of Dahlias.

James Vick, Rochester, N.Y., first prize, $6.

Twenty-four Dahlias.

James Vick, Rochester, N. Y., first prize, $3.

Twelve Dahlias.

James Vick, Rochester, N. Y., first prize, $3.

American Seedling Dahlias.

James Vick, Rochester, N. Y., first prize, $1.

Collections of Roses.

Ellwanger & Barry, Rochester, N. Y., first prize, $6.

Twenty-four Roses.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.

..... Twelve Roses.

Ellwanger & Barry, Rochester, N. Y., first prize, $3.

Collections of Annual Phloxes.

James Vick, Rochester, N. Y., first prize, $5.

Twelve Perennial Phloxes.

James Vick, Rochester, N. Y., first prize, $3.
Ellwanger & Barry, Rochester, N. Y., second prize, $2.

Seedling Phloxes.

James Vick, Rochester, N. Y., first prize, $1.

Collections of Verbenas.

James Vick, Rochester, N. Y., first prize, $5.

Twelve Verbenas.

James Vick, Rochester, N. Y., first prize, $3.

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AMERICAN SEEDLING VERBENAS.

James Vick, Rochester, N. Y., first prize, $1.

COLLECTIONS OF ASTERS.

James Vick, Rochester, N. Y., first prize, $3.

COLLECTIONS OF CELOSIAS.

James Vick, Rochester, N. Y., first prize, $3.

COLLECTIONS OF LILIES.

James Vick, Rochester, N. Y., first prize, $3.

COLLECTIONS OF PANSIES.

James Vick, Rochester, N. Y., first prize, $3.

COLLECTIONS OF TEN-WEEK STOCKS.

James Vick, Rochester, N. Y., first prize, $3.

COLLECTIONS OF GLADIOLUS.

James Vick, Rochester, N. Y., first prize, $3.

TWELVE GLADIOLUS.

James Vick, Rochester, N. Y., first prize, $2.

AMATEUR LIST—EXHIBITIONS OF CUT FLOWERS

Abram Stone, Stanwix, N. Y., first prize, $10.
Edwin Van Allen, Bethlehem, N. Y., second prize, $5.

COLLECTIONS OF DAHLIAS.

Abram Stone, Stanwix, N. Y., first prize, $6.

TWELVE DAHLIAS.

Abram Stone, Stanwix, N. Y., first prize, $3.

COLLECTIONS OF VERBENAS.

Edwin Van Allen, Bethlehem, N. Y., first prize, $5.
Abram Stone, Stanwix, N. Y., second prize, $3.

TWELVE VERBENAS.

Abram Stone, Stanwix, N. Y., first prize, $3.

SIX VERBENAS.

Edwin Van Allen, Bethlehem, N. Y., first prize, $2.

COLLECTIONS OF PHLOXES.

Edwin Van Allen, Bethlehem, N. Y., first prize, $5.
Abram Stone, Stanwix, N. Y., second prize, $3.

COLLECTIONS OF ASTERS.

Edwin Van Allen, Bethlehem, N. Y., first prize, $3.
Abram Stone, Stanwix, N. Y., second prize, $2.

COLLECTIONS OF PANSIES.

Edwin Van Allen, Bethlehem, N. Y., first prize, $3.
Abram Stone, Stanwix, N. Y., second prize, $2.

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COLLECTIONS OF TEN-WEEK STOCKS.

Abram Stone, Stanwix, N. Y., first prize, $3.

COLLECTIONS OF GLADIOLUS.

Abram Stone, Stanwix, N. Y., second prize, $2.

COLLECTIONS OF EVERLASTING FLOWERS.

Abram Stone, Stanwix, N. Y., first prize, $3.

GENERAL LIST — OPEN TO ALL COMPETITORS.

PLANTS IN POTS, BOUQUETS, FLORAL DESIGNS, ETC. — TWENTY GREEN-HOUSE PLANTS.

Ellwanger & Barry, Rochester, N. Y., first prize, $10.
John B. Keller, Rochester, N. Y., second prize, $5.

TEN GREEN-HOUSE PLANTS.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.
John B. Keller, Rochester, N. Y., second prize, $3.

SIX VARIEGATED-LEAVED PLANTS.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.

SINGLE VARIEGATED-LEAVED PLANTS.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

TWELVE ZONAL PELARGONIUMS.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.

ONE (SINGLE) ZONAL PELARGONIUM.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

SIX (DOUBLE) ZONAL PELARGONIUMS.

Ellwanger & Barry, Rochester, N. Y., first prize, $3.

ONE (DOUBLE) ZONAL PELARGONIUM.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

PAIRS OF HAND BOUQUETS.

James Vick, Rochester, N. Y., first prize, $5.
John B. Keller, Rochester, N. Y., second prize, $3.

PAIRS OF TABLE BOUQUETS.

James Vick, Rochester, N. Y., first prize, $5.
Ellwanger & Barry, Rochester, N. Y., second prize, $3.

BUTTON-HOLE BOUQUETS.

James Vick, Rochester, N. Y., first prize, $2.
Ellwanger & Barry, Rochester, N. Y., second prize, $2.

BASKETS OF FLOWERS.

James Vick, Rochester, N. Y., first prize, $5.
Ellwanger & Barry, Rochester, N. Y., second prize, $3.

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DINNER-TABLE DESIGNS.

James Vick, Rochester, N. Y., first prize, $5.
Ellwanger & Barry, Rochester, N. Y., second prize, $3

NEW PLANTS AND FLOWERS.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.
John B. Keller, Rochester, N. Y., second prize, $3.

FRUITS.

PROFESSIONAL LIST — COLLECTIONS OF APPLES.

Ellwanger & Bary, Rochester, N. Y., first prize, $10.

TWENTY VARIETIES OF APPLES.

Ellwanger & Barry, Rochester, N. Y., first prize, $8.

COLLECTIONS OF PEARS.

Ellwanger & Barry, Rochester, N. Y., first prize, $15.
Hovey & Co., Rochester, N. Y., second prize, $10.

TWENTY VARIETIES OF PEARS.

Ellwanger & Barry, Rochester N. Y., first prize, $10.

TEN VARIETIES OF PEARS.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.

DISH OF PEACHES (ONE VARIETY).

Ellwanger and Barry, Rochester, N. Y., first prize, $2.

COLLECTIONS OF PLUMS.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.

TEN VARIETIES OF PLUMS.

Ellwanger & Barry, Rochester, N. Y., first prize, $3.

DISH OF PLUMS (ONE VARIETY, TEN SPECIMENS).

Ellwanger & Barry, Rochester, N. Y., first prize $2.

DISH OF QUINCES (TEN SPECIMENS).

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

COLLECTIONS OF NATIVE GRAPES.

Ellwanger & Barry, Rochester, N. Y., first prize, $10.
H. E. Hooker, Rochester, N. Y., second prize, $5.

FIVE VARIETIES OF NATIVE GRAPES.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.

COLLECTIONS OF FOREIGN GRAPES.

Ellwanger & Barry, Rochester, N. Y., first prize, $10.

FIVE VARIETIES OF FOREIGN GRAPES.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.

DISH OF FOREIGN GRAPES (WHITE).

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

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DISH OF FOREIGN GRAPES (BLACK).

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

AMATEUR LIST — COLLECTIONS OF APPLES.

R. H. Brown, Greece, N. Y., first prize, $10.
H. J. Kirby Greece, N. Y., second prize, $5.

TEN VARIETIES OF APPLES.

H. F. Leak & Son, Rochester, N. Y., first prize, $5.
Ira B. Crandall, Alfred Centre, N. Y., second prize, $3.

FIVE VARIETIES OF APPLES.

Ira B. Crandall, Alfred Centre, N. Y., first prize, $3.
L. P. Baker, Penfield, N. Y., second prize, $2.

COLLECTIONS OF PEARS.

D. K. Bell, West Brighton, N. Y., first prize, $5.
Mrs. J. Sproat, Rochester, N. Y., second prize, $3.

FIVE VARIETIES OF PEARS.

Mrs. J. Sproat, Rochester, N. Y., first prize, $5.
D. K. Bell, West Brighton, N. Y., second prize, $3.

COLLECTIONS OF PEACHES.

D. E. Rogers, Wheatland, N. Y., first prize, $3.

DISH OF PEACHES (ONE VARIETY).

D. E Rogers, Wheatland, N. Y., first prize, $2.

COLLECTIONS OF PLUMS.

Samuel Ellis, Alfred Centre, N. Y., first prize, $3.

DISH OF PLUMS (TEN SPECIMENS).

Samuel Ellis, Alfred Centre, N. Y., first prize, $1.

DISH OF QUINCES (TEN SPECIMENS).

Mrs. J. Sproat, Rochester, N. Y., first prize, $2.
D. K. Bell, West Brighton, N. Y., second prize, $1.

COLLECTIONS OF NATIVE GRAPES.

Jesse Fowler, Henrietta, N. Y., first prize, $6.

FIVE VARIETIES OF NATIVE GRAPES.

Robert Blair, Rochester, N. Y., first prize, $3.
Jesse Fowler, Henrietta, N. Y., second prize, $2.

SINGLE DISHES — OPEN TO ALL COMPETITORS — APPLES — FALL PIPPIN.

George Bahringer, Pittsford, N. Y., first prize, $2.

BALDWIN.

C. L. G. Blessing, Slingerlands, N. Y., first prize, $2.

KING OF TOMPKINS COUNTY.

R. H. Brown, Greece, N. Y., first prize, $2.

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NORTHERN SPY.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

RHODE ISLAND GREENING.

Ira B. Crandall, Alfred Centre, N. Y., first prize, $2.

ROXBURY RUSSET.

Ira B. Crandall, Alfred Centre, N. Y., first prize, $2.

TWENTY OUNCE.

Thomas Ford, Irondequoit, N. Y., first prize, $2.

ESOPUS SPITZENBERG.

George Bahringer, Pittsford, N. Y., first prize, $2.

RED CANADA.

I. P. Baker, Penfield, N. Y., first prize, $2.

PEARS — BARTLETT.

George Bahringer, Pittsford, N. Y., first prize, $2.

BEURRE D'ANJOU.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

BEURRE CLAIRGEAU.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

BEURRE BOSC.

F. W. Lay, Greece, N. Y., first prize, $2.

DUCHESSE D'ANGOULEME.

George Zimmerman & Son, Buffalo, N. Y., first prize, $2.

DOYENNE BOUSSOCK.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

FLEMISH BEAUTY.

Mrs. James Sproat, Rochester, N. Y., first prize, $2.

SECKEL.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

SHELDON.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

LAWRENCE.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

WINTER NELIS.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

GRAPES — CONCORD.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

CATAWBA.

Henry G. Hubacheck, Rochester, N. Y., first prize, $2.

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DELAWARE.

George Bahringer, Pittsford, N. Y., first prize, $2.

HARTFORD.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

ISABELLA.

George Bahringer, Pittsford, N. Y., first prize, $2.

ANY OF ROGERS' VARIETIES.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

AWARDS IN THE MISCELLANEOUS CLASS AT ROCHESTER FAIR, CONFIRMED BY THE EXECUTIVE COMMITTEE.

ARTISTIC.

Mrs. M. B. Logan, Rochester, N. Y., certificate of highest merit for a case of natural flowers chemically preserved.

Rochester Business University, Rochester, N. Y., certificate of highest merit for specimens of plain and ornamental penmanship.

Mrs. F. B. Shearer, Pittsford, N. Y., certificate of highest merit for a hair wreath.

Mrs. F. B. Shearer, Fairport, N. Y., certificate of merit for a bouquet of wax flowers.

Mrs. J. A. Sheffer, Rochester, N. Y., certificate of merit for wax crosses.

Taylor Business College, Rochester, N. Y., certificate of merit for specimens of ornamental penmanship, business writing, pen drawing and card writing.

Miss M. L. Wagner, Rochester, N. Y., certificate of merit for oil paintings.

Mrs C. E. Wolsey, Rochester, N. Y., certificate of highest merit for crayon drawings and oil paintings.

Miss Lina H. Worcester, Rochester, N. Y., certificate of highest merit for silk embroidery, tambour work.

FURNITURE, UTENSILS, ETC.

W. C. Baker, Rochester, N. Y., certificate of merit for Holmes' spring bed.

A. E. Cooper, Cooper's Plains, N. Y., certificate of highest merit for balcony and other chairs.

F. L. Palmer, Rochester, N. Y., certificate of highest merit for adjustable folding chairs.

J. W. Bent Manufacturing Co., Chicago, Ill., certificate of highest merit for extension table.

W. B. Crich & Co., Hornellsville, N. Y., certificate of highest merit for Crich's improved patent spiral spring bed bottom.

O. S. Garretson, Buffalo, N. Y., certificate of highest merit for school furniture, etc.

Harrington & Richardson, Rochester, N. Y., certificate of highest merit for exhibition of children's carriages, velocipedes, hobby horses, etc.

J. E. Hayden & Co., Rochester, N. Y., certificate of highest merit for exhibition of cabinet work and furniture.

Howe & Rogers, Rochester, N. Y., certificate of highest merit for exhibition of carpets and rugs.

Joseph Lipe, Rochester, N. Y., certificate of highest merit for inlaid work and display of work done with scroll saw.

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Charles Reynell, Rochester, N. Y., certificate of highest merit for fine workmanship of specimens of scroll sawing.

Taft Bros. & Co., Rochester, N. Y., certificate of highest merit for exhibition of leaping toy horses.

HOUSEKEEPING ARTICLES.

American Chemical Manufacturing Co., Rochester, N. Y., certificate of highest merit for patent wood-box, shoe-blacking and polish paste.

G. S. Benedict, Rochester, N. Y., certificate of highest merit for Colorado dried smoked beef.

Condimental Food Co., Philadelphia, Pa., certificate of highest merit for condimental food.

Gaff, Fleischmann & Co., Buffalo, N. Y., certificate of highest merit for compressed yeast.

John Greenway, Syracuse, N. Y., certificate of highest merit for samples of ale, porter and lager.

Edwin T. Marsh, Rochester, N. Y., certificate of highest merit for the concentrated American "True Blue" blueing for laundry use.

Rochester Manufacturing Co., Rochester, N. Y., certificate of highest merit for the Randall adjustable shirt-bosom ironing board.

O. F. Tiffany, Syracuse, N. Y., certificate of highest merit for the Pacific fruit and vegetable evaporator.

Wells, Richardson & Co., Burlington, Vt., certificate of highest merit for their perfected butter color.

MANUFACTURES.

A. G. Bassett, Rochester, N. Y., certificate of highest merit for Hoyt's German cologne.

James R. Chamberlain, Rochaster, N. Y., certificate of highest merit for exhibition of rubber goods.

J. W. Graves & Co., Rochester, N. Y., certificate of highest merit for manufacture of confectionery.

Sargeant & Greenleaf, Rochester, N. Y., certificate of highest merit for display of locks.

Kenyon & Hunt, Rochester, N. Y., certificate of highest merit for exhibition of furs.

Joseph Lipe, Rochester, N. Y., certificate of highest merit for toilet articles, etc.

McConnell & Jones, Rochester, N. Y., certificate of highest merit, for masons' and roofing materials.

Z. Manvel, Rochester, N. Y., certificate of highest merit for samples of cement roofing and tile.

Edwin T. Marsh, Rochester N. Y., certificate of highest merit for lamp post mail box.

William Robinson, Rochester, N. Y., certificate of highest merit for roof.

Taft Bros. & Co., Rochester, N. Y., certificate of highest merit for roller composition.

G A. Widmer, Rochester, N. Y., certificate of highest merit for fancy articles of vegetable ivory.

Alfred Wright, Rochester, N. Y., certificate of highest merit for exhibition of perfumery and flavoring extracts.

MECHANICAL AND SCIENTIFIC.

Dr. Homer Belding, Rochester, N. Y., certificate of highest merit for mechanical dentistry and dentists' instruments.

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H. Burden & Sons, Troy, N. Y., certificate of highest merit for model of the Burden horse-shoe machine and samples of horse-shoes.

George R. Fuller, Rochester, N. Y., certificate of highest merit for Bly's patent artificial limbs.

M. B Hudson, Canandaigua, N. Y., certificate of highest merit for the champion bag-holder.

H. J. Kintz, Greece, N. Y., certificate of highest merit for his computing board.

Frederick Klein, Rochester New York, certificate of highest merit for plumbers' fittings.

H. P. Merrell, Rochester, N. Y., certificate of highest merit for Merrell's burglar alarm bolt.

W. H. Moon and Stephen Wheeler, Rochester, N. Y., certificate of highest merit for the Rochester metallic fire-escape.

James W. Allis, Rochester, N. Y., certificate of highest merit for a collection of butterflies.

A. A. Capeling & Co., Rochester, N. Y., certificate of highest merit for Capeling's patent dust and oil-guard for protecting the bearings of sewing-machines.

Saxton & Amidon, Buffalo, N. Y., certificate of highest merit for Steinlein's embossing and fluting-machine.

George W. Vining, Albany, N. Y., certificate of highest merit for Bickford's family knitting machine.

Daniel Richmond, Rochester, N. Y., certificate of highest merit for a new stove or furnace grate.

J. E. & J. H. Shaut, Hornellsville, N. Y., certificate of highest merit for the Crown oil-stoves.

AWARDS

At the Thirty-eighth Annual Cattle Show and Fair of the New York State Agricultural Society, held at Elmira, September 9 to September 13, 1878.

CATTLE.

SHORTHORNS — SHORTHORN HERD PRIZE.

Daniel B. Haight, Dover Plains, N. Y., large gold medal.

Bull, Oneida Prince, red, bred by W. S. King, Minneapolis, Minn., calved October 25, 1875, sire Seventh Duke of Oneida 14056, dam Lady Mary by Hotspur (31393), gr. d. Baroness by Barrington (30501).

Cow, Constance 5th, roan, bred by A. M. Winslow, Putney, Vt, calved June 5, 1871, sire Earl of Seaham 8077, dam Constance 3rd by Clifton Duke (23580), gr. d. Constance 2nd by Duke of Airdrie (12730).

Cow, Constance of Lyndale 2nd, white, bred by W. S. King, Minneapolis, Minn., calved November 12, 1871, sire Scotsman (27435), dam Constance 6th by Seventh Duke of Airdrie (23718), gr. d. Constance 3rd by Clifton Duke (23580).

Heifer, Constance of Lyndale 8th, roan, bred by W. S. King, Minneapolis, Minn., calved March 10, 1876, sire Seventh Lord Oxford 17586, dam Constance of Lyndale 2nd by Scotsman (27435), gr. d. Constance 6th by Seventh Duke of Airdrie (22718).

Heifer, Lady Mary 10th, red with a little white, bred by W. S. King, Minneapolis,

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Minn., calved September 5, 1876, sire Earl of Seaham 8077, dam Lady Mary 2nd by Climax 5453, gr. d. Lady Mary by Hotspur (31393).

Heifer, Constance of Brookdale, roan, bred by exhibitor, calved March 5, 1877, sire Wild Eyes Duke 21325, dam Constance 6th by Seventh Duke of Airdrie (23718), gr. d. Constance 3rd by Clifton Duke (23580).

BULLS OVER THREE YEARS OLD.

M. B. Ritter, Waterloo, N. Y., first prize, $50; Prince of the River, red with a little white, bred by Charles F. Wadsworth, Geneseo, N. Y., calved August 13, 1871, sire Grand Duke 8247, dam Rosaline by Berkshire Duke 2539, gr. d. Tuberose 5th by Tornado 1040.

Franklin C. Cornell, Ithaca, N. Y., second prize, $25; Oxford Geneva, roan, bred by F. Leney & Son, Wateringbury, England, calved Marth 18, 1875, sire Eighth Duke of Geneva (28390), dam Seventh Maid of Oxford by Seventh Duke of Airdrie (23718), gr. d. Second Maid of Oxford by Grand Duke of Oxford (16184).

BULLS TWO YEARS OLD.

Franklin C. Cornell, Ithaca, N. Y., first prize, $40; Vick's Oxford, red, bred by exhibitor, calved October 24, 1875, sire Tenth Earl of Oxford 14161, dam Victoria 9th by Royal Briton (27351) gr. d. Victoria 7th by Sixth Duke of Thorndale (23794).

Daniel B. Haight, Dover Plains, N. Y., second prize, $20; Oneida Prince, red, bred by W. S. King, Minneapolis, Minn., calved October 25, 1875, sire Seventh Duke of Oneida 14056, dam Lady Mary by Hotspur (31393) gr. d. Baroness by Barrington (30501).

BULLS ONE YEAR OLD.

Daniel B. Haight, Dover Plains, N. Y., first prize, $30. Baron of Brookdale, red bred by exhibitor, calved March 6, 1877, sire Third Baron of Lyonsdale 18967, dam Lady Mary by Hotspur (31393), gr. d. Baroness by Barrington (30501).

Franklin C. Cornell, Ithaca, N. Y., second prize, $15; Oxford Lad, red with a little white, bred by exhibitor, calved February 9, 1877, sire Tenth Earl of Oxford 14161, dam Victoria 10th by Second Duke of Oneida 9926, gr. d. Vignette by Fourth Lord Oxford 5903.

COWS OVER THREE YEARS OLD.

Benjamin Fellows, Clifton, N. Y., first prize, $40; Niobe 1st, red with a little white, bred by Judson Howard, Mendon, N. Y., calved January 21, 1873, sire Major 10425, dam Niobe by Clifton Duke 2nd 7711, gr. d. Nannie Williams 10th by Duke of Airdrie 2743.

Daniel B. Haight, Dover Plains, N. Y., second prize, $20; Constance of Lyndale 2nd, white, bred by W. S. King, Minneapolis, Minn., calved November 12, 1871, sire Scotsman (27435), dam Constance 6th by Seventh Duke of Airdrie (23718), gr. d. Constance 3rd by Clifton Duke (23580).

HEIFERS TWO YEARS OLD.

Daniel B. Haight, Dover Plains, N. Y., first prize, $30; Constance of Lyndale 8th, roan, bred by W. S. King, Minneapolis, Minn., calved March 10, 1876, sire Seventh Lord Oxford 17586, dam Constance of Lyndale 2nd by Scotsman (27435), gr. d. Constance 6th by Seventh Duke of Airdrie (23718).

M. B. Ritter, Waterloo, N. Y., second prize, $15; Princess 1st, red, bred by exhibitor, calved June 24, 1876, sire Prince of the River 12677, dam Maud by Warwick 6282, gr. d. Flora by Duke of Airdrie 2743.

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HEIFERS ONE YEAR OLD.

M. B. Ritter, Waterloo, N.Y., first prize, $20; Princess 2nd, red with a little white, bred by exhibitor, calved May 24, 1877, sire Prince of the River 12677 dam Maud by Warwick 6282, gr. d. Flora by Duke of Airdrie 2743.

Daniel B. Haight, Dover Plains, N. Y., second prize, $10; Lady Mary 10th, red with a little white, bred by W. S. King, Minneapolis, Minn., calved September 5, 1876, sire Earl of Seaham 8077, dam Lady Mary 2nd by Climax 5453, gr. d. Lady Mary by Hotspur (31393).

HEIFER CALVES.

Benjamin Fellows, Clifton, N. Y., blue ribbon; Niobe 2nd, red, bred by exhibitor, calved March 7, 1878, sire Treble Gloster 7331, dam Niobe 1st by Major 10425, gr. d. Niobe by Clifton Duke 2nd 7711.

DEVONS—DEVON HERD PRIZE.

D. & J. Banker, Franklin Forks, Pa., large gold medal.

Bull, Prince of Wales 15th, bred by Joseph Hilton, New Scotland, N. Y., calved December 11, 1874, sire Prince of Wales 652, dam Edith 5th by Prince of Wales 652, gr. d. Edith 2nd by Sachem (517).

Cow, Rose of Baltimore 1st, bred by Orrin Prichard, Springfield, Pa., calved 1867, sire Bloomfield 169, dam Longhorned Baltimore by Norfolk 998, gr. d. by Eclipse, 841.

Cow, Edith 5th, bred by Joseph Hilton, New Scotland, N. Y., calved December 30, 1871, sire Prince of Wales 652, dam Edith 2nd by Sachem (517), gr. d. Edith, imported by Lewis G. Morris.

Cow, Rose of Baltimore 3rd, bred by Orrin Prichard, Springfield, Pa., calved April 5, 1872, sire Comet 804, dam Rose of Baltimore 1st by Bloomfield 169, gr. d. Longhorned Baltimore by Norfolk 998.

Cow, Emily, bred by exhibitors, calved April 6, 1875, sire Prince of Wales 12th 1026, dam Edith 2nd by Sachem (517), gr. d. Edith, imported by Lewis G. Morris

Heifer, Belle 8th, bred by Joseph Hilton, New Scotland, N. Y., calved December 7, 1875, sire Prince of Wales 652, dam Belle 4th by Prince of Wales 652 gr. d. Belle 2nd by Sachem (517).

BULLS OVER THREE YEARS OLD.

Walter Cole, Batavia, N. Y., first prize, $50; Cole's Puritan 2nd, bred by exhibitor, calved March 1, 1874, sire Lovely's Huron 3rd 591, dam Helena 34th by Iroquois 564, gr. d. Helena 33rd by Comet 22.

D. & J. Banker, Franklin Forks, Pa., second prize, $25; Prince of Wales 15th, bred by Joseph Hilton, New Scotland, N. Y., calved December 11, 1874, sire Prince of Wales 652, dam Edith 5th by Prince of Wales 652, gr. d. Edith 2nd by Sachem (517).

BULLS TWO YEARS OLD.

G. L. Fletcher, Sidney Centre, N. Y., first prize, $40; Genesee 3rd, bred by J. A. Pomeroy, Sidney Centre, N. Y., calved May 13, 1876, sire Genesee 2nd 524, dam Alida by Empire 424 H, gr. d. Edith, imported by L. G. Morris, Fordham, N. Y.

BULLS ONE YEAR OLD.

Walter Cole, Batavia, N. Y., first prize, $30; Puritan Boy, bred by exhibitor, calved May 7, 1877, sire Duke of Flitton 9th 838, dam Helena 34th by Iroquois 564, gr. d. Helena 33rd, by Comet 22.

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Adelbert F. Bronson, Vernon, N. Y., second prize, $15; Lord Nelson 2nd, bred by Truman Baker, Earlville, N. Y., calved March 20, 1877, sire Lord Nelson 949½, dam Edith by Chenango 463, gr. d. Alida by Empire 424 H.

COWS OVER THREE YEARS OLD.

B. F. Peck, East Bethany, N. Y., first prize, $40; Candy Girl 2nd, bred by Walter Cole, Batavia, N. Y., calved April 18, 1872, sire Lovely's Huron 3rd 591, dam Candy Girl by Empire 5th 213, gr. d. Lovely 8th by Candy 776.

Walter Cole, Batavia, N. Y., second prize, $20; Helena 46th, bred by exhibitor, calved March 20, 1872, sire Lovely's Huron 3rd 591, dam Helena 34th by Iroquois 564, gr. d. Helena 33rd by Comet 22.

HEIFERS TWO YEARS OLD.

Adelbert F. Bronson, Vernon, N. Y., first prize, $30; Nameless, bred by exhibitor, calved March 10, 1876, sire Litchfied 947, dam Cherry 3rd by Mohawk 610, gr. d. Cherry by Young Baltimore 599 H.

B. F. Peck, East Bethany, N. Y., second prize, $15; Victoria 5th, bred by exhibitor, calved January 31, 1876, sire Nemophila's Huron 621, dam Victoria 2nd by Mohawk 610, gr. d. Victoria by Huron 2nd 250.

HEIFERS ONE YEAR OLD.

Adelbert F. Bronson, Vernon, N. Y., first prize, $20; Fancy, bred by exhibitor, calved April, 1877, sire Doctor 819½, dam Susie by Genesee 2nd 524, gr. d. Alida by Empire 424 H.

Walter Cole, Batavia, N. Y., second prize, $10; Lovely 26th, bred by exhibitor, calved April 16, 1877, sire Duke of Flitton 9th 838, dam Lovely 21st by Lovely's Huron 3rd 591, gr. d. Lovely 18th by Young Exeter (765).

HEREFORDS — HEREFORD HERD PRIZE.

John Merryman, Hayfields, Md., large gold medal

Bull Illinois, red, white face, bred by T. L. Miller, Beecher, Ill., calved August 6, 1875, sire Success (5031), dam Kate by John Bull (3885), gr. d. Queen of the West by Merryman (4789).

Cow, Giantess, red, white face, bred by John Henry Arkwright, Hampton Green, Herefordshire, Eng., calved August 26, 1868, sire Sir Oliver 2nd (1733), dam Gay Lass by Riff Raff (1052), gr. d. Gaily by Quicksilver 2nd.

Cow, Princess Victoria, red with white face, bred by exhibitor, calved February 21, 1871, sire Sir Richard 2nd (4984), dam Giantess by Sir Oliver 2nd (1733), gr. d. Gay Lass by Riff Raff (1052).

Heifer, Polly Carter, red with white face, bred by exhibitor, calved December 20, 1875, sire Sir Richard 2nd (4984), dam Milton 2nd by Marion (2683), gr. d. Cora by Cronkhill (1948).

Heifer, Princess Beatrice, red with white face, bred by exhibitor, calved February 7, 1876, sire Sir Richard 2nd (4984), dam Giantess by Sir Oliver 2nd (1733), gr. d. Gay Lass by Riff Raff (1052).

Heifer, Princess Charlotte, red with white face, bred by exhibitor, calved April 8, 1877, sire Sir Richard (4984), dam Giantess by Sir Oliver 2nd (1733), gr. d. Gay Lass by Riff Raff (1052).

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BULLS OVER THREE YEARS OLD.

John Merryman, Hayfields, Md., first prize, $50; Illinois, red, white face, bred by T. L. Miller, Beecher, Ill., calved August 6, 1875, sire Success (5031), dam Kate by John Bull (3885), gr. d. Queen of the West by Merryman (4789).

COWS OVER THREE YEARS OLD.

John Merryman, Hayfields, Md., first prize, $40; Giantess, red, white face, bred by John Henry Arkwright, Hampton Green, Herefordshire, Eng., calved August 26, 1868, sire Sir Oliver 2nd (1733), dam Gay Lass by Riff Raff (1052), gr. d. Gaily by Quicksilver 2nd.

HEIFERS TWO YEARS OLD.

John Merryman, Hayfields, Md., first prize, $30; Polly Carter, red with white face, bred by exhibitor, calved December 20, 1875, sire Sir Richard 2nd (4984), dam Milton 2nd by Marion (2633), gr. d. Cora by Cronkhill (1948).

HEIFERS ONE YEAR OLD.

John Merryman, Hayfields, Md., first prize, $20; Princess Victoria 2nd, red with white face, bred by exhibitor, calved January 15, 1877, sire Canadian (4394), dam Princess Victoria by Sir Richard 2nd (4984), gr. d. Giantess by Sir Oliver 2nd (1733).

AYRSHIRES — AYRSHIRE HERD PRIZE.

Jardine & Sons, Hamilton, Canada, large gold medal.

Bull, Mars 1st, dark red and white, bred by John McIntyre, Bromley, Canada, calved October 5, 1873, sire Abbot 804 O. R., dam Cuthberta 7th by Mars 715 O. R., gr. d. Cuthberta 1st, whose sire and dam were imported by Mrs. Cuthbert.

Cow, Burns' Jean, dark red and white, bred by A. Love, Margaret Mills, Ayrshire, calved May 20, 1870.

Cow, Princess Louise, dark red and white, bred by exhibitors, calved April 21, 1872, imported in dam Ayrshire Lass.

Cow, Heather Bell, dark red and white, bred by exhibitors, calved November 10, 1874, sire Wilson 438 O. R., imported, dam Bonny Lass, imported.

Heifer, Hamilton Lass, dark red and white, bred by exhibitors, calved October 4, 1875, sire Cherokee 444 O. R., imported, dam Blooming Heather, imported.

Heifer, Phyllis Mars, red and white, bred by exhibitors, calved September 6, 1877, sire Mars 1st, dam Highland Mary by George the Fourth (in Scotland), gr. d. Blooming Heather, imported.

BULLS OVER THREE YEARS OLD.

Jardine & Sons, Hamilton, Canada, first prize, $50; Mars 1st, dark red and white, bred by John McIntyre, Bromley, Canada, calved October 5, 1873, sire Abbot 804 O. R., dam Cuthberta 7th by Mars 715 O. R., gr. d. dam Cuthberta 1st, whose sire and dam were imported by Mrs. Cuthbert.

Jardine & Sons, Hamilton, Canada, second prize, $25; Billy Muir, dark red and white, bred by W. Love, in Ayrshire, calved October 21, 1873, sire Robbie, bred by Robert Wilson, dam Bonnie Jess.

BULLS TWO YEARS OLD.

E. B. Hawks, Wells Bridge, N. Y., first prize, $40; Mikado, deep red and white, bred by Walter Wattles, Sidney, N. Y., calved March 15, 1876, sire 334 Glasgow, dam Mischief by 285 Dandy, gr. d. Magic by 293 Doon.

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F. P. & A. M. Cornell, Sylvania, Penn., second prize, $30; Mack, red and white, bred by exhibitors, calved March 22, 1876, sire 467 Scotch Lad, dam Ellie by 509 Victor, gr. d. Moss Rose by 92 Habbie Simpson.

BULLS ONE YEAR OLD.

Jardine & Sons, Hamilton, Canada, first prize, $30; Robert Mars, white and red, bred by exhibitors, calved August 1, 1877, sire Mars 1st, dam Annie Laurie by Wilson, imported, gr. d. Ayrshire Lass, imported.

James F. Converse, Woodville, N. Y., second prize, $15; Giggle, red and white, bred by exhibitor, calved April, 1877, sire Fearnot 1134, dam Velvet 2nd by Woodville Chief 1542, gr. d. Velvet by Gen. Grant 176.

COWS OVER THREE YEARS OLD.

Jardine & Sons, Hamilton, Canada, first prize, $40; Heather Bell, dark red and white, bred by exhibitors, calved November 10, 1874, sire Wilson 438 O. R., imported, dam Bonny Lass, imported.

James Miller & Son, Penn Yan, N. Y., second prize, $20; Daisy, red and white, bred by exhibitors, calved February 18, 1875, sire Sir Colin 1457, dam White Rose by Heather Jock 37 C. R., gr. d. Spotted Beauty by Billy 49 C. R.

HEIFERS TWO YEARS OLD.

William Crozier, Northport, N. Y., first prize, $30; Lady Lily, red and white, bred by M. H. Cochrane, Compton, Canada, calved May 4, 1876, sire Colonel, imported, dam Perfect Beauty by a son of Model of Perfection, gr. d. Beauty by Prince.

James F. Converse, Woodville, N. Y., second prize, $15; Dahlia 5th, mostly red, bred by exhibitor, calved April, 1876, sire Woodville Chief 1542, dam Dahlia, imported.

HEIFERS ONE YEAR OLD.

Jardine & Sons Hamilton, Canada, first prize, $20; Fanny Mars, red and white, bred by exhibitors, calved December 25, 1876, sire Mars 1st, dam Maggie by Wilson, 438 O. R., imported, gr. d. Selsa by Young Elderslie 524 O. R.

Jardine & Sons, Hamilton, Canada, second prize, $10; Alice Mars, red and white, bred by exhibitors, calved December 21, 1876, sire Mars 1st, dam Highland Mary, imported in dam Blooming Heather.

HOLSTEINS — HOLSTEIN HERD PRIZE.

Unadilla Valley Stock Breeders' Association, West Edmeston, N. Y., large gold medal.

Bull, Burgomaster of the Beemster, black and white, bred by G. I. Hongeveld, in North Holland, calved May 10, 1874.

Cow, Maid of Twisk, black and white, bred by F. Slot, Twisk, North Holland, calved November, 1873.

Cow, Jacoba Hartog, black and white, bred by Jacob Hartog, Beemster, North Holland, calved March, 1874.

Cow, Marianna Beets, black and white, bred by Jan Beets, Jr, Beemster, North Holland, calved March 3, 1874.

Cow, Cjrietje Bleeker, black and white, bred by Cornelia Bleeker, in North Holland calved in spring of 1874.

Cow, Sijtje Bleeker, black and white, bred by Cornelia Bleeker, in North Holland, calved March 18, 1874.

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BULLS OVER THREE YEARS.

Smith & Powell, Syracuse, N. Y., first prize, $50; Uncle Tom, black and white, bred by Gerrit S. Miller, Peterboro, N. Y., calved April 17, 1875, sire Rip Van Winkle 35, dam Topsy by Hollander 20, gr. d. Dowager, imported.

Unadilla Valley Stock Breeders' Association, West Edmeston, N. Y., second prize, $25: Burgomaster of the Beemster, black and white, bred by G. I. Hongeveld in North Holland, calved May 10, 1874.

BULLS TWO YEARS OLD.

H. C. Hoffman, Horseheads, N. Y., first prize, $40; Dyken, black and white, bred by T. Bent, North Holland, calved April 26, 1876, imported November, 1876, by George E. Brown, Elgin, Ill.

Unadilla Valley Stock Breeders' Association, West Edmeston, N. Y., second prize, $20; Paul Potter, black and white, bred in Holland, calved September 6, 1875.

BULLS ONE YEAR OLD.

H. C. Hoffman, Horseheads, N. Y., first prize, $30; Eagle, black and white, bred by exhibitor, calved March 12, 1877, sire Holland Prince 113, dam Belle, imported.

W. H. Gifford, Syracuse, N. Y., second prize, $15; Kars, black and white, bred by exhibitor, calved July 1, 1877, sire Bleecker 8, dam Agnes 2nd, imported by John H. Comer, Goshen, N. Y.

COWS OVER THREE YEARS OLD.

Unadilla Valley Stock Breeders' Association, West Edmeston, N. Y., first prize, $40; Maid of Twisk, black and white, bred by F. Slot, Twisk, North Holland, calved November, 1870.

H. C. Hoffman, Horseheads, N. Y., second prize, $20; Jufrou, black and white, bred by Jacob Doetz, North Holland, calved March, 1869, imported 1871.

HEIFERS TWO YEARS OLD.

H. C. Hoffman, Horseheads, N. Y., first prize, $20; Annie Darling, white and black, bred by exhibitor, calved December 8, 1875, sire Holland Prince 113, dam Jufrou, imported.

W. H. Gifford, Syracuse, N. Y., second prize, $15; Galaxy, black and white, bred by exhibitor, calved May 11, 1876, sire Bleecker 8, dam Texelaar 12th by Third Dutchman 37, gr. d. Texelaar 8th by Zuider Zee 2nd 57.

HEIFERS ONE YEAR OLD.

Smith & Powell, Syracuse, N. Y., first prize, $20; Netherland Queen, black and white, bred by A. C. Koning, Beemster, North Holland, calved March 26, 1877, imported in 1878, by exhibitors.

Unadilla Valley Stock Breeders' Association, West Edmeston, N. Y., second prize, $10; Cjrietje Bleecker 2nd, black and white, bred by T. E. Whiting, Concord, Mass., calved November 26, 1876, sire Elswout 2nd, dam Cjrietje Bleecker, imported.

JERSEYS — JERSEY HERD PRIZE.

William Crozier, Northport, N. Y., large gold medal.

Bull, Controller, dark fawn, some white, bred by F. R. Starr, Litchfield, Conn., calved December 31, 1876, sire Litchfield 674, dam Mel 4th by McClellan 4th 85, gr. d. Mel by McClellan 25.

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Cow, Eugenie 2nd, lemon fawn, bred by Samuel C. Colt, Hartford, Conn, calved June 18, 1870, sire Rob Roy 17, dam Eugenie, imported.

Cow, Josephine 2nd, smoky fawn, bred by exhibitor, calved April 20, 1871, sire Beacon Comet 675, dam Josephine, imported.

Cow, Josephine Beacon, dark fawn and white, bred by exhibitor, calved February 23, 1874, sire Touchstone 315, dam Josephine 2nd by Beacon Comet 675, gr. d. Josephine, imported.

Cow, Belle Hinman, fawn and white, bred by George E. Waring, Newport, R. I., calved April 30, 1874, sire Belisario 640, dam Flora Hinman by Hinman 78, gr. d. Florette by Brandywine 64.

Heifer, Cowles' Eirene 2nd, fawn and white, bred by J. C. Hurd, Forestville, Conn., calved March 28, 1876, sire Lord Bronx 2nd 1730, dam Cowles' Eirene by Ishmael Hurd 1548, gr. d. Puss by Major Tunxes 1547.

BULLS OVER THREE YEARS OLD.

George Sidney Camp, Owego, N. Y., first prize, $50; Kilbourn, smoky fawn, four white feet, bred by exhibitor, calved February 16, 1875, sire Beacon Comet 13th 1281, dam Helen by Derby 253, gr. d. Buttercup by Fashion 862.

William Simpson, Jr., New York, N. Y., second prize, $25; Bluetooth, solid fawn, bred by O. S. Hubbell, Stratford, Conn., calved June 28, 1875, sire St. Helier 45, dam Silene by St. Helier 45, gr. d. Lara by Arab 245.

BULLS TWO YEARS OLD.

John D. Wing, Millbrook, N. Y., first prize, $40; Niobe Duke, solid dark smoky fawn, bred by J. Stricker Jenkins, Baltimore, Md., calved April 24, 1876, sire Jeweller 1385, dam Niobe 6th by Mogul 532, gr. d. Niobe, imported.

John P. Gulliver, Binghamton, N. Y., second prize, $20; Helios, French gray and black, bred by exhibitor, calved May 8, 1876, sire Rubicon 1202, dam Balmoral by Uncas 628, gr. d. Flora Hudson by Gen. Grant 47.

BULLS ONE YEAR OLD.

William Crozier, Northport, N. Y., first prize, $30; Controller, dark fawn, some white, bred by F. R. Starr, Litchfield, Ct., calved December 31, 1876, sire Litchfield 674, dam Mel 4th by McClellan 4th 85, gr. d. Mel by McClellan 25.

C. B. Strait, Sylvania, Pa.; Aberdeen of Clermont, solid fawn, bred by E. L. Clarkson, Tivoli, N. Y., calved April 17, 1877, sire Index 1743, dam Daisy of Clermont by Gerald 895, gr. d. Jennie by Napoleon 291.

COWS OVER THREE YEARS OLD.

William Crozier, Northport, N. Y., first prize, $40; Josephine 2nd, smoky fawn, bred by exhibitor, calved April 20, 1871, sire Beacon Comet 675, dam Josephine, imported.

John D. Wing, Millbrook, N. Y., second prize, $20; Oak Leaf, solid dark fawn, bred by exhibitor, calved September 19, 1873, sire Devilshoof 866, dam Echo by Lord Nelson 860, gr. d. Edith 2nd by Saturn 94.

HEIFERS TWO YEARS OLD.

John P. Gulliver, Binghamton, N. Y., first prize, $30; Milky Way, fawn gray and white, bred by exhibitor, calved May 18, 1876, sire Rubicon 1202, dam Lactea by Fancy Joe 298, gr. d. Flora by Astyanax 389.

William Crozier, Northport, N. Y., second prize, $15; Cowles' Eirene 2nd, fawn and white, bred by J. C. Hurd, Forestville, Ct., calved March 28, 1876, sire

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Lord Bronx 2nd 1730, dam Cowles' Eirene by Ishmael Hurd 1548, gr. d. Puss by Major Tunxes 1547.

HEIFERS ONE YEAR OLD.

George Sidney Camp, Owego, N. Y., first prize, $20; Lorinda, French gray, white spots under belly and on legs, bred by exhibitor, calved January 4, 1877, sire Kilbourn 2029, dam Molly Oaks, imported.

John P. Gulliver, Binghamton, N. Y., second prize, $10; Florina, fawn and white, bred by exhibitor, calved May 18, 1877, sire Koba Jr. 2471, dam Pomona by Fancy Joe 298, gr. d. Flora by Astyanax 389.

GUERNSEYS — BULLS OVER THREE YEARS OLD.

George Sidney Camp, Owego, N. Y., second prize, $25; Owego Forest, yellow-fawn and white, bred by exhibitor, calved April 17, 1875, sire Forest 48, dam Pink by ——, gr. d. Larkspur by ——.

BULLS ONE YEAR OLD.

William Crozier, Northport, N. Y., first prize, $30; Lord Falmouth, fawn and white, bred by Mr. Maindonald, St. Andrews, Isle of Guernsey, calved May 10, 1877, sire Young Billy, dam first prize cow.

HEIFERS TWO YEARS OLD.

George Sidney Camp, Owego, N. Y., first prize $30; Rose 2nd, yellow-fawn and white, bred by exhibitor, calved August 8, 1876, sire La Fayette, dam Rose Forest, imported.

HEIFERS ONE YEAR OLD.

George Sidney Camp, Owego, N. Y., first prize, $20; Gentle, yellow-fawn and white, bred by exhibitor, calved March 16, 1877, sire La Fayette, dam Katie 15th by Samuel Fee's bull 81, gr. d. Guernsey, imported by J. P. Swain.

CATTLE OF ANY KIND — MILCH COWS.

Unadilla Valley Stock Breeders' Association, West Edmeston, N. Y., first prize, $30; Holstein, or Dutch Friesian cow, Jacoba Hartog, black and white, bred by Jacob Hartog, Beemster, North Holland, calved in the spring of 1874.

H. C. Hoffman, Horseheads, N. Y., second prize, $15; Holstein cow, Holland Princess, white and black, bred by exhibitor, calved January 5, 1874, sire Holland Prince 113, dam Holland Queen, imported.

FAT OXEN OVER FOUR YEARS OLD.

Benjamin Fellows, Clifton, N. Y., first prize, $30; roan, grade short-horn, 4 years.

Benjamin Fellows, Clifton, N. Y., second prize, $15; white, grade short-horn, 4 years.

FAT STEERS UNDER FOUR YEARS OLD.

John Merryman, Hayfields, Md., first prize, $30; red with white face, bred by exhibitor, calved December 1, 1874, pure Hereford, sire Sir Richard 2nd (4984), dam Bohemian Maid by Admiral (2375).

Benjamin Fellows, Clifton, N. Y., second prize, $15; red and white, 3 years, grade short-horn.

FAT COWS OVER FOUR YEARS OLD.

Charles Balcom, Painted Post, N. Y., first prize, $30; red and white, 4 years, grade short-horn.

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John Merryman, Hayfields, Md., second prize, $15; Queen of Athens, red with white face, bred by exhibitor, calved June 11, 1873, pure Hereford.

FAT HEIFERS UNDER FOUR YEARS OLD.

Charles Balcom, Painted Post, N. Y., first prize, $30; white and red, 3 years, grade short-horn.

John Merryman, Hayfields, Md., second prize, $15; Rosebud 2nd, red with white face, bred by exhibitor, calved March 29, 1876, pure Hereford.

EXTRA AWARD.

G. L. Fletcher, Sidney Centre, N. Y., silver medal; yoke of grade Devon oxen, dark red, 5 years, of special merit as to training.

HORSES.

CLYDESDALES AND THEIR CROSSES — STALLIONS OVER FOUR YEARS OLD.

Smith & Powell, Syracuse, N. Y., first prize, $50; King of the East, bay, star and white hind feet, bred by Andrew Montgomery, Castle Douglas, Scotland, foaled in 1873, imported June, 1875, sire the Marquis, dam Lovely by Lochfergus Champion.

David I. McKnutt, Palmyra, N. Y., second prize, $25; Young Champion, bay, 16, 3, five years, sire Malcolm, thorough-bred Clydesdale imported in 1871.

STALLIONS TWO YEARS OLD.

David I. McKnutt, Palmyra, N. Y., first prize, $30; Joker, bright bay, 16, 2 years, sire Sawyer's horse by imported Clydesdale.

Harry Goodell, North Parma, N. Y., second prize $15; White-footed Dick, dark brown, 15, bred by D. C. Hagen, East Kendall, N. Y., sire Robin Hood, Jr.

STALLIONS ONE YEAR OLD.

Smith & Powell, Syracuse, N. Y., second prize, $10; Highland Rover, bay, white hind ankles, bred by Sidney Dunbar, Ontario, Canada, foaled June, 1877, sire King of the East, dam Lady Johnson by Campsie Jock, imported.

MARES OVER FOUR YEARS OLD.

Smith & Powell, Syracuse, N. Y., first prize, $40; Highland Belle, dapple brown with strip and white feet, bred by James Pierson, Whitby, Ont., foaled April 1, 1873, sire Scotland's Glory, dam by Old Netherby, imported, gr. d. Jess by Lord Byron, imported.

FILLIES THREE YEARS OLD.

Smith & Powell, Syracuse, N. Y., first prize, $30; Young Giantess, bay, small star and one white hind foot, bred by Wm. Eadie, Russell, Ont., foaled in 1875, sire Campsie Jock, dam by Young Robin Hood, imported, gr. d. by Tweedside.

Isaac S. Wells, Egypt, N. Y., second prize, $15; Stella Howard, bay or brown, 16, three years, bred by exhibitor, sire Monroe Morgan, dam by Genesee Black Hawk, gr. d. by Buckland's Clydesdale.

FILLIES TWO YEARS OLD.

Smith & Powell, Syracuse, N. Y., first prize, $20; Bonnie, bay, small star, bred by exhibitors, foaled June 11, 1876, sire Duke of Ratho, imported, dam by Highland Chief.

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FILLIES ONE YEAR OLD.

Smith & Powell, Syracuse, N. Y., second prize, $5; Lady Clyde, brown with strip, bred by exhibitors, foaled March 17, 1877, sire Duke of Argyle, dam Lady McDonald, gr. d. by Clark's Clydesdale.

PERCHERONS AND THEIR CROSSES — STALLIONS OVER FOUR YEARS OLD.

Henry Tubbs, Osceola, Pa., first prize, $50; Valiant, gray, 16.1, twelve years, bred by Younet Baptiste, Ferriere au Doyen, France, imported in December, 1874, by M. W. Dunham, Wayne, Ill.

J. J. Parker, West Chester, Pa., second prize, $25; Louis Philippe, black, sired in France, foaled in America, January 18, 1873, sire Valiant, owned by M. Peleray, St. Cigneat, France, dam Rosa Bonheur by Colin the 2nd.

STALLIONS THREE YEARS OLD.

Nelson D. Davis, Caton, N. Y., first prize, $40; Buster, dapple gray, bred by M. W. Dunham, Wayne, Ill., sire imported Success, dam by Sipe's Sampson.

STALLIONS ONE YEAR OLD.

E. W. Fisher, Bristol, N. Y., first prize, $20; Sherman, bright bay, black points, bred by John Shay, East Bloomfield, N. Y., sire Grand Monarch, imported by H. B. Sherman, Wis., dam by McMillan Messenger, gr. d. by Morgan's Norman.

William Roe, Sullivanville, N. Y., second prize, $10; chestnut, bred by exhibitor, sire French Chief, imported.

MARES OVER FOUR YEARS OLD.

Edward Clisdell, Corning, N. Y., first prize, $40; Gay, gray, 14¼, bred by M. W. Dunham, Wayne, Ill., sire imported Independent, foal at foot by Estraba.

THOROUGHBREDS AND THEIR CROSSES — STALLIONS OVER FIVE YEARS OLD.

Samuel Parson, Oxford Depot, N. Y., first prize, $100; Happy Prince, bay, 15.2, 7 years, bred by exhibitor, sire Happy Medium, dam by Vermont Morgan, gr. d. by American Eclipse.

Theodore Coleman, Sheldrake, N. Y., second prize, $30; Seneca Chief, bay, 15.3, 14 years, bred by William Jordan, Bullville, N. Y., sire Rysdyk's Hambletonian, dam by Young Hector, gr. d. by Walden Messenger.

STALLIONS FOUR YEARS OLD.

Dauphin Dexter, Whitesville, N. Y., first prize, $60; Allegany Boy, bay roan, 16.1, sire Wood's Hambletonian.

Anson Holmes, Webb's Mills, N. Y., second prize, $30; Independence, roan, 15.2, bred by exhibitor, sire Wood's Hambletonian, dam Clara by Traveller.

STALLIONS THREE YEARS OLD.

Henry M. Little, Macedon, N. Y., first prize, $50; Tremont, bay, 16¼ hands, bred by A. J. Alexander, Spring Station, Ky., sire Belmont, dam Virginia by Alexander's Abdallah, gr. d. Gray Goose by Nottingham Norman.

H. C. Weed, West Danby, N. Y., second prize, $25; black, 15.2, bred by C. C. Williams, foaled May 2, 1875, sire Black Hawk Messenger.

STALLIONS TWO YEARS OLD.

J. A. Pomeroy, Sidney Centre, N. Y., first prize, $40; bay, 15.2, bred by exhibitor.

Smith & Powell, Syracuse, N. Y., second prize, $20; Enterprise, bay, white hind

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feet, bred by exhibitors, foaled May 4, 1876, sire Reveller, dam Susie by Powers' Hambletonian, gr. d. by Post Boy.

STALLIONS ONE YEAR OLD.

Smith & Powell, Syracuse, N. Y., first prize, $30; Fascinator, bright chestnut, bred by exhibitors, foaled September 24, 1876, sire Oracle, dam Bay Kit by Myrick horse, gr. d. by Morgan Tiger.

Frank M. Beyea, Alford, N. Y., second prize, $15; Turco, dark bay, bred by exhibitor, sire Young Ethan Allen, dam Kitty Cotteril by Tom Thumb, gr. d. by Gray Norman.

MARES OVER FIVE YEARS OLD.

Isaac S. Wells, Egypt, N. Y., first prize, $60; Middy Morgan, chestnut, 15.2, 7 years, bred by Joel W. Benedict, Victor, N. Y, sire Monroe Morgan, dam by Carr's Consternation.

J. S. Holbert, Chemung, N. Y., second prize, $30; Nig, black, 15.2, 10 years sire Brown Patchen, dam by Seeley's Black Hawk, three months' foal at foot by Young Morrill, Jr.

FILLIES FOUR YEARS OLD.

A. D. Griswold, Southport, N. Y., second prize, $25; Kit, black, 16.2.

FILLIES THREE YEARS OLD.

Ephraim G. Beach, Fleming, N. Y., first prize, $40; bay, small star, one white foot, 15 3, bred by exhibitor, sire Mambrino Duncan.

Isaac S. Wells, Egypt, N. Y., second prize, $20; Morgan Queen, black, 15.1, bred by Joel N. Benedict, Victor, N. Y., sire Monroe Morgan, dam by Live Yankee, gr. d. by Biggart's Rattler.

FILLIES TWO YEARS OLD.

Henry M. Little, Macedon, N. Y., first prize, $30; Belle of Ashland, dark bay, bred by Treacy & Simmons, Ashland Park, Ky., sire Post's Hambletonian, dam by American Clay, gr. d. by Downing's Bay Messenger.

Ephraim G. Beach, Fleming, N. Y., second prize, $15; bay, black points, bred by exhibitor, sire Mambrino Duncan, dam Flora by Kentucky Hunter.

FILLIES ONE YEAR OLD.

A. W. Smith, Cuba, N. Y., first prize, $20; Lady Morgan, bay, foaled June 15, 1877, sire Jeff Davis, dam by Old Morg.

Ephraim Kies, Horseheads, N. Y., second prize, $10; bay, bred by exhibitor, sire Andy Johnson.

HARNESS AND SADDLE HORSES — COACH PAIRS.

C. C. B. Walker, Corning, N. Y., first prize, $40; blacks, 16, four and five years.

J. A. Rumsey, Seneca Falls, N. Y., second prize, $20; bay, 16.3, five years.

PHÆTON PAIRS.

Thomas Gaylorson, Corning, N. Y., first prize, $40; white, 15, six years.

James R. Simonson, Altay, N. Y., second prize, $20; bay, 15.2, five and six years.

COUPE HORSES.

John Fury, Ithaca, N. Y., first prize, $30; light gray, 15.2, nine years, bred by Philip Everhart, Newfield, N. Y., sire Norman Leslie.

Peck & Wickham, Tioga, Pa., second prize, $15; bay, 16 1, four years, sire Warwick Boy by Iron Duke.

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ROADSTERS.

C. S. Smith, Cuba, N. Y., first prize, $30; Mollie, black, 15.2, seven years, sire Black Hawk Prince, dam by Old Morg.

Theodore Coleman, Sheldrake, N. Y., second prize, $15; Cayuga Star, bay, hind ankles white, 15, twelve years, bred by exhibitor, sire Rysdyk's Hambletonian, dam by Seeley's American Star.

SADDLE HORSES.

H. Bowen, Medina, N. Y., first prize, $30; Barney, bay, 15.3, five years.

George S. Lowman, Wellsburgh, N. Y., second prize, $15; brown, 14, seven years, bred by exhibitor, sire Bacchus, dam by American Star.

JACKS AND MULES — PAIRS OF MULES.

L. B. Smith, Southport, N. Y., first prize, $30; brown, 15, six and seven years.

SHEEP, SWINE AND POULTRY.

LONG-WOOLED SHEEP — COTSWOLD RAMS OVER TWO YEARS OLD.

George Ingersoll, Charlton, N. Y., first prize, $20.

William Potter, Johnstown, N. Y., second prize, $10.

COTSWOLD RAMS ONE YEAR OLD.

George Ingersoll, Charlton, N. Y., first prize, $20.

William Potter, Johnstown, N. Y., second prize, $10.

PENS OF (THREE) COTSWOLD EWES OVER TWO YEARS OLD.

George Ingersoll, Charlton, N. Y., first prize, $20.

Joseph Harris, Rochester, N. Y., second prize, $10.

PENS OF (THREE) COTSWOLD YEARLING EWES.

Joseph Harris, Rochester, N. Y., first prize, $20.

George Ingersoll, Charlton, N. Y., second prize, $10.

LINCOLNS — PENS OF (THREE) LINCOLN EWES OVER TWO YEARS OLD.

T. Walter & Sons, Westchester, Pa., first prize, $20.

PENS OF (THREE) LINCOLN EWES ONE YEAR OLD.

T. Walter & Sons, Westchester, Pa., first prize, $20.

MIDDLE-WOOLED SHEEP — SOUTHDOWN RAMS OVER TWO YEARS OLD.

John D. Wing, Millbrook, N. Y., first prize, $20; bred by exhibitor.

John D. Wing, Millbrook, N. Y., second prize, $10; bred by exhibitor.

SOUTHDOWN RAMS ONE YEAR OLD.

John D. Wing, Millbrook, N. Y., first prize, $20; bred by exhibitor.

Daniel B. Haight, Dover Plains, N. Y., second prize, $10.

PENS OF (THREE) SOUTHDOWN EWES OVER TWO YEARS OLD.

John D. Wing, Millbrook, N. Y., first prize, $20; bred by exhibitor.

John D. Wing, Millbrook, N. Y., second prize, $10; bred by Lord Walsingham.

PENS OF (THREE) SOUTHDOWN YEARLING EWES.

John D. Wing, Millbrook, N. Y., first prize, $20; bred by exhibitor.

Daniel B. Haight, Dover Plains, N. Y., second prize, $10.

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SHROPSHIRE RAMS OVER TWO YEARS OLD.

Berosus Cook, Otego, N. Y., first prize, $20.
Henry C. French, Wells, Pa., second prize, $10

SHROPSHIRE RAMS ONE YEAR OLD.

C. D. Smead, Logan, N. Y., first prize, $20; Prince, bred by Dwight Merriman, Jackson, Mich., dropped in May, 1871.

PENS OF (THREE) SHROPSHIRE EWES OVER TWO YEARS OLD.

Mrs. L. C. Fish, Otego, N. Y., first prize, $20.
Berosus Cook, Otego, N. Y., second prize, $10.

PENS OF (THREE) SHROPSHIRE YEARLING EWES.

C. D. Smead, Logan, N. Y., first prize, $20; Belle, Blossom and Addie, bred by Dwight Merriman; Jackson, Mich., dropped May, 1877.

HAMPSHIRE RAMS ONE YEAR OLD.

Henry Metcalf, Canandaigua, N. Y., first prize, $20.

PENS OF (THREE) HAMPSHIRE EWES OVER TWO YEARS OLD.

Henry Metcalf, Canandaigua, N. Y., first prize, $20.

PENS OF (THREE) HAMPSHIRE YEARLING EWES.

Henry Metcalf, Canandaigua, N. Y., second prize, $10.

FINE WOOLED SHEEP — MERINOS BRED FOR FINENESS OF WOOL — RAMS OVER TWO YEARS OLD.

William L. Chamberlain, Red Hook, N. Y., first prize, $20.
Carl Heyne, Red Hook, N. Y., second prize, $10.

RAMS ONE YEAR OLD.

Joel W. Hardy, Palmyra, N. Y., first prize, $20.
Carl Heyne, Red Hook, N. Y., second prize, $10.

PENS OF (THREE) EWES OVER THREE YEARS OLD.

William L. Chamberlain, Red Hook, N. Y., first prize, $20.
Carl Heyne, Red Hook, N. Y., second prize, $10.

PENS OF (THREE) EWES TWO YEARS OLD OR UNDER.

William L. Chamberlain, Red Hook, N. Y., first prize, $20.
Carl Heyne, Red Hook, N Y., second prize, $10.

MERINOS BRED FOR WEIGHT OF FLEECE — RAMS OVER TWO YEARS OLD.

S. B. Lusk, Batavia, N. Y., first prize, $20; bred by E. E. Brown, New Hope, N.Y.
Brunson & Mariner, East Bloomfield, N. Y., second prize, $10.

RAMS ONE YEAR OLD.

Brunson & Mariner, East Bloomfield, N. Y., first prize, $20.
S. B. Lusk, Batavia, N. Y., second prize, $10.

PENS OF (THREE) EWES OVER THREE YEARS OLD.

Brunson & Mariner, East Bloomfield, N. Y., first prize, $20.
E. Townsend, Pavillion Centre, N. Y., second prize, $10.

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PENS OF (THREE) EWES TWO YEARS OLD OR UNDER.

Brunson & Mariner, East Bloomfield, N. Y., first prize, $20.
E. Townsend, Pavillion Centre, N. Y., second prize, $10.

MERINOS BRED FOR LENGTH OF STAPLE — RAMS OVER TWO YEARS OLD.

E. Townsend, Pavillion Centre, N. Y., first prize, $20.

RAMS ONE YEAR OLD.

E. Townsend, Pavillion Centre, N. Y., first prize, $20.
S. B. Lusk, Batavia, N. Y., second prize, $10.

PENS OF (THREE) EWES OVER THREE YEARS OLD.

S. B. Lusk, Batavia, N. Y., first prize, $20.

PENS OF (THREE) EWES TWO YEARS OLD OR UNDER.

E. Townsend, Pavillion Centre, N. Y., first prize, $20,
S. B. Lusk, Batavia, N. Y., second prize, $10.

SWINE — LARGE WHITE BREED — BOARS OVER ONE YEAR OLD.

T. Walter & Sons, West Chester, Pa., first prize, $20; Gill, bred by exhibitors.
David Shappee, Alpine, N. Y., second prize, $10.

BOARS UNDER ONE YEAR OLD.

T. Walter & Sons, West Chester, Pa., first prize, $20; Commodore 3rd, bred by exhibitors.
Thomas Bros., Franklinville, N. Y., second prize, $10; Cheshire.

SOWS OVER ONE YEAR OLD.

T. Walter & Sons, West Chester, Pa., first prize, $20; Lady 3rd, bred by exhibitors.
A. L. Thomas, Cuba, N. Y., second prize, $10.

SOWS UNDER ONE YEAR OLD.

T. Walter & Sons, West Chester, Pa., first prize, $20; Pomona 8th, bred by exhibitors.
Thomas Bros., Franklinville, N. Y., second prize, $10; Cheshire.

POLAND-CHINA — BOARS OVER ONE YEAR OLD.

B. F. Tracy, Owego, N. Y., first prize, $20; Great Western (formerly General), bred by D. M. Magie & Co., sire Sweepstakes, dam Lady Lake by Frank.
Thomas Cuddeback, Big Flats, N. Y., second prize, $10; bred by J. F. Camp.

BOARS UNDER ONE YEAR OLD.

B. F. Tracy, Owego, N. Y., first prize, $20; bred by D. M. Magie & Co., sire World Beater.
William Bowers, Delaware Station, N. J., second prize, $10; Poland Chief, bred by B. F. Tracy, Owego, N. Y.

SOWS OVER ONE YEAR OLD.

B. F. Tracy, Owego, N. Y., first prize, $20; Magie's Favorite, bred by D. M. Magie & Co., sire John, dam Queen by Sambo.
B. F. Tracy, Owego, N. Y., second prize, $10; Black Beauty, bred by D. M. Magie & Co., sire George, dam Favorite by Hero.

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SOWS UNDER ONE YEAR OLD.

B. F. Tracy, Owego, N. Y., first prize, $20; Valley Queen, bred by exhibitor, sire Captain, dam Magie's Favorite by John.

B. F. Tracy, Owego, N. Y., second prize, $10; Black Kate, bred by exhibitor, sire Magie's Black Prince, dam Black Beauty by George.

DUROC OR RED — BOARS OVER ONE YEAR OLD.

W. M. Holmes' Sons, Greenwich, N. Y., first prize, $20.

BOARS UNDER ONE YEAR OLD.

W. M. Holmes' Sons, Greenwich, N. Y., first prize, $20.

SOWS OVER ONE YEAR OLD.

W. M. Holmes' Sons, Greenwich, N. Y., first prize, $20.

SOWS UNDER ONE YEAR OLD.

W. M. Holmes' Sons, Greenwich, N. Y., first prize, $20.

SMALL WHITE BREED — BOARS OVER ONE YEAR OLD.

H. H. Ingersoll, Owego, N. Y., first prize, $20; King William, bred by Jacob Dove, England.

W. H. Cole, Clinton, N. J., second prize, $10; King John 3rd, sire King John, imported, dam Snowdrop, imported.

BOARS UNDER ONE YEAR OLD.

H. H. Ingersoll, Owego, N. Y., first prize, $20; Crown Prince.

H. H. Ingersoll, Owego, N. Y., second prize, $10; Susie's Model.

SOWS OVER ONE YEAR OLD.

W. H. Cole, Clinton, N. J., first prize, $20; Beauty, sire imported Duke of Yorkshire, dam Rose of Keighley.

H. H. Ingersoll, Owego, N. Y., second prize, $10; Princess, bred by Lord Ellesmere, England.

SOWS UNDER ONE YEAR OLD.

H. H. Ingersoll, Owego, N. Y., first prize, $20; Ada Bell.

W. H. Cole, Clinton, N. J., second prize, $10; Graceful 1st, sire Duke 3rd, dam Princess 2nd.

BERKSHIRES — BOARS OVER ONE YEAR OLD.

H. Bowen, Medina, N. Y., first prize, $20; Sambo IX, Jr., bred by Wm. Smith, Michigan, farrowed October 24, 1876, sire Sambo IX, imported, dam Susie, imported, gr. d. Maid of Oxford.

A. G. Barlow & Co., North Ridgeway, N. Y., second prize, $10; Hillside Prince, bred by H. Humfrey, sire Lineal Baronet, dam Lady Hillside.

BOARS UNDER ONE YEAR OLD.

H. Bowen, Medina, N. Y., first prize, $20; President, bred by exhibitor, farrowed March 8, 1878, sire Sambo IX, Jr., dam Hambrook Beauty 2nd, gr. d. Hambrook Beauty, imported.

Oscar Larison, Lawrenceville, Pa., second prize, $10.

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SOWS OVER ONE YEAR OLD.

Benjamin Fellows, Clifton, N. Y., first prize, $30; Primrose 7th, sire England's Glory, dam Primrose by 303 M., gr. d. by Idstone.

H. Bowen, Medina, N. Y., second prize, $10; Hambrook Beauty 2nd, bred by Wm. Smith, Michigan, farrowed September 8, 1876, sire Sambo IX, imported, dam Hambrook Beauty, imported, gr. d. B.

SOWS UNDER ONE YEAR OLD.

Oscar Larison, Lawrenceville, Pa., first prize, $20.

C. P. Armstrong, Geneseo, N. Y., second prize, $10; six months, sire Monroe 204, dam Exquisite 6th.

ESSEX — BOARS OVER ONE YEAR OLD.

Joseph Harris, Rochester, N. Y., first prize, $20.

Joseph Harris, Rochester, N. Y., second prize, $10.

BOARS UNDER ONE YEAR OLD.

J. S. Giles, Apalachin, N. Y., first prize, $20.

J. S. Giles, Apalachin, N. Y., second prize, $10.

SOWS OVER ONE YEAR OLD.

Joseph Harris, Rochester, N. Y., first prize, $20.

Joseph Harris, Rochester, N. Y., second prize, $10.

SOWS UNDER ONE YEAR OLD.

George E. Harris, West Elmira, N. Y., first prize, $20; bred by Jonas S. Van Duzer, Horseheads, N. Y.

J. S. Giles, Apalachin, N. Y., second prize, $10.

POULTRY — COLLECTIONS OF PURE-BRED POULTRY.

George W. Chidsey, Elmira, N. Y., silver medal.

PAIRS OF LIGHT BRAHMAS.

George W. Chidsey, Elmira, N. Y., first prize, $5.

D. G. Eacker, Havana, N. Y., second prize, $3.

PAIRS OF DARK BRAHMAS.

J. S. Giles, Apalachin, N. Y., first prize, $5.

D. G. Eacker, Havana, N. Y., second prize, $3.

PAIRS OF BUFF, LEMON OR CINNAMON COCHINS.

George W. Chidsey, Elmira, N. Y., first prize, $5.

J. S. Giles, Apalachin, N. Y., second prize, $3.

PAIRS OF PARTRIDGE OR GROUSE COCHINS.

Horace H. Batterson, Elmira, N. Y., first prize, $5.

J. S. Giles, Apalachin, N. Y., second prize, $3.

PAIRS OF WHITE COCHINS.

George W. Chidsey, Elmira, N. Y., first prize, $5.

M. J. Emhoff, Elmira, N. Y., second prize, $3.

PAIRS OF BLACK COCHINS.

D. G. Eacker, Havana, N. Y., first prize, $5.

George W. Chidsey, Elmira, N. Y., second prize, $3.

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PAIRS OF COLOURED DORKINGS.

J. M. Seymour, Clark's Mills, N. Y., first prize, $5.
John Hope, Millbrook, N. Y., second prize, $3.

PAIRS OF SILVER-GRAY DORKINGS.

Samuel C. Drew, Cuba, N. Y., first prize, $5.
John Hope, Millbrook, N. Y., second prize, $3.

PAIRS OF WHITE DORKINGS.

J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

PAIRS OF DOMINIQUES.

George W. Chidsey, Elmira, N. Y., first prize, $5.
W. M. Holmes' Sons, Greenwich, N. Y., second prize, $3.

PAIRS OF GOLDEN SPANGLED HAMBURGHS.

Newton Adams, Utica, N. Y., first prize, $5.
William W. Albro, Elmira, N. Y., second prize, $3.

PAIRS OF SILVER SPANGLED HAMBURGHS.

Newton Adams, Utica, N. Y., first prize, $5.
Newton Adams, Utica, N. Y., second prize, $3.

PAIRS OF GOLDEN PENCILLED HAMBURGHS.

George W. Chidsey, Elmira, N. Y., first prize, $5.
William H. Underwood, Homer, N. Y., second prize, $3.

PAIRS OF SILVER PENCILLED HAMBURGHS.

Newton Adams, Utica, N. Y., first prize, $5.
Newton Adams, Utica, N. Y., second prize, $3.

PAIRS OF BLACK HAMBURGHS.

Newton Adams, Utica, N. Y., first prize, $5.
William H. Underwood, Homer, N. Y., second prize, $3.

PAIRS OF BLACK SPANISH.

Horace D. Batterson, Elmira, N. Y., first prize, $5.
George W. Chidsey, Elmira, N. Y., second prize, $3.

PAIRS OF WHITE LEGHORNS (YELLOW LEGS, SINGLE COMBS).

Newton Adams, Utica, N. Y., first prize, $5.
Newton Adams, Utica, N. Y., second prize, $3.

PAIRS OF BROWN LEGHORNS.

John Hope, Millbrook, N. Y., first prize, $5.
Horace B. Batterson, Elmira, N. Y., second prize, $3.

PAIRS OF BLACK LEGHORNS.

George W. Chidsey, Elmira, N. Y., first prize, $5.
Mike K. Thurston, West Elmira, N. Y., second prize, $3.

PAIRS OF DOMINIQUE LEGHORNS.

Charles D. Brooks, Addison, N. Y., first prize, $5.

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PAIRS OF PLYMOUTH ROCKS.

E. A. Scott, Elmira, N. Y., first prize, $5.
H. M. Ferguson, Austinville, Pa., second prize, $3.

PAIRS OF CREVE-CŒURS.

J. M. Seymour, Clark's Mills, N. Y., first prize, $5.
J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

PAIRS OF HOUDANS.

Jesse Lyons, Catherine, N. Y., first prize, $5.
John Hope, Millbrook, N. Y., second prize, $3.

PAIRS OF LA-FLECHE.

J. M. Seymour, Clark's Mills, N. Y., first prize, $5.
J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

PAIRS OF BLACK POLISH.

George W. Chidsey, Elmira, N. Y., first prize, $5.
William H. Underwood, Homer, N. Y., second prize, $3.

PAIRS OF WHITE POLISH (WHITE CRESTS).

William H. Underwood, Homer, N. Y., second prize, $3.

PAIRS OF SILVER POLISH.

George W. Chidsey, Elmira, N. Y., first prize, $5.

PAIRS OF BLACK-BREASTED RED GAMES.

George W. Chidsey, Elmira, N. Y., first prize, $5.
George W. Chidsey, Elmira, N. Y., second prize, $3

PAIRS OF SILVER DUCK-WING GAMES.

John Hope, Millbrook, N. Y., first prize, $5.
William H. Underwood, Homer, N. Y., second prize, $3.

PAIRS OF IRISH GRAY OR SHAWL-NECK GAMES.

John Hope, Millbrook, N. Y., first prize, $5.

PAIRS OF WHITE-PILE GAMES.

John Hope, Millbrook, N. Y., first prize, $5.

PAIRS OF OTHER APPROVED WELL-BRED GAMES.

George E. Reed, Horseheads, N. Y., second prize, $3.

PAIRS OF RED GAME BANTAMS.

C. S. Smith, Cuba, N. Y., first prize, $5.
C. W. Canfield, Athens, Pa., second prize, $3.

PAIRS OF RED-PILE GAME BANTAMS

George W. Chidsey, Elmira, N. Y., first prize, $5.

PAIRS OF SILVER DUCK-WING GAME BANTAMS.

William H Underwood, Homer, N. Y., first prize, $5.
J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

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PAIRS OF YELLOW DUCK-WING GAME BANTAMS.

J. M. Seymour, Clark's Mills, N. Y., first prize, $5.
C. L. G. Blessing, Slingerlands, N. Y., second prize, $3.

PAIRS OF SILVER-LACED SEBRIGHT BANTAMS.

Samuel C. Drew, Cuba, N. Y., first prize, $5.

PAIRS OF GOLD-LACED SEBRIGHT BANTAMS.

George W. Chidsey, Elmira, N. Y., first prize, $5.
George W. Chidsey, Elmira, N. Y., second prize, $3.

PAIRS OF BLACK BANTAMS.

J. M. Seymour, Clark's Mills, N. Y., first prize, $5.
George W. Chidsey, Elmira, N. Y., second prize, $3.

PAIRS OF OTHER BANTAMS.

Horace B. Batterson, Elmira, N. Y., first prize, $5; booted white Bantams.

PAIRS OF PEARL GUINEA FOWLS.

O. Howland & Son, Auburn, N. Y., first prize, $3.
C. L. G. Blessing, Slingerlands, N. Y., second prize, $2.

PAIRS OF WHITE GUINEA FOWLS.

William H. Underwood, Homer, N. Y., first prize, $3.
Samuel C. Drew, Cuba, N. Y., second prize, $2.

PAIRS OF PEA FOWLS.

D. J. Turner, Horseheads, N. Y., first prize, $3.
Samuel C. Drew, Cuba, N. Y., second prize, $2.

PAIRS OF SILVER PHEASANTS.

William W. Albro, Elmira, N. Y., first prize, $3.

PAIRS OF TOULOUSE GEESE.

A. G. Barlow & Co., North Ridgway, N. Y., first prize, $5.

PAIRS OF BREMEN GEESE.

O. Howland & Son, Auburn, N. Y., first prize, $5.
Samuel C. Drew, Cuba, N. Y., second prize, $3.

PAIRS OF WHITE CHINA GEESE.

O. Howland & Son, Auburn, N. Y., first prize, $5.

PAIRS OF BROWN CHINA GEESE.

O. Howland & Son, Auburn, N. Y., first prize, $5.

PAIRS OF WILD GEESE.

W. J. Roy, Wells, Pa., first prize, $5.

PAIRS OF ROUEN DUCKS.

J. M. Seymour, Clark's Mills, N. Y., first prize, $5.
O. Howland & Son, Auburn, N. Y., second prize, $3.

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PAIRS OF AYLESBURY DUCKS.

J. M. Seymour, Clark's Mills, N. Y., first prize, $5.
William W. Albro, Elmira, N. Y., second prize, $3.

PAIRS OF CAYUGA DUCKS.

O. Howland & Son, Auburn, N. Y., first prize, $5.
O. Howland & Son, Auburn, N. Y., second prize, $3.

PAIRS OF MUSK OR MUSCOVY DUCKS.

C. L. G. Blessing, Slingerlands, N. Y., first prize, $5.

PAIRS OF PEKIN DUCKS.

Washington Rowley, Corning, N. Y., first prize, $5.
Washington Rowley, Corning, N. Y., second prize, $3.

PIGEONS—PAIRS OF POUTERS.

George W. Chidsey, Elmira, N. Y., first prize, $3.
J. S. Giles, Apalachin, N. Y., second prize, $2.

PAIRS OF CARRIERS.

George W. Chidsey, Elmira, N. Y., first prize, $3.
George W. Chidsey, Elmira, N. Y., second prize, $2.

PAIRS OF SHORT-FACED TUMBLERS.

George W. Chidsey, Elmira, N. Y., first prize, $3.
J. S. Giles, Apalachin, N. Y., second prize, $2.

PAIRS OF BARBS.

George W. Chidsey, Elmira, N. Y., second prize, $2.

PAIRS OF TURBITS (WINGED).

George W. Chidsey, Elmira, N. Y., first prize, $3; yellow
George W. Chidsey, Elmira, N. Y., second prize, $2; red.

PAIRS OF SHAKING FANTAILS.

George W. Chidsey, Elmira, N. Y., first prize, $3.
Austin Anderton, Elmira, N. Y., second prize, $2.

PAIRS OF JACOBINS.

J. S. Giles, Apalachin, N. Y., first prize, $3.
George W. Chidsey, Elmira, N. Y., second prize, $2.

PAIRS OF BLUE ROCKS.

George W. Chidsey, Elmira, N. Y., first prize, $3.

PAIRS OF DRAGOONS.

George W. Chidsey, Elmira, N. Y., first prize, $3.

PAIRS OF ANTWERPS.

Austin Anderton, Elmira, N. Y., first prize, $3.
George W. Chidsey, Elmira, N. Y., second prize, $2.

COLLECTIONS OF CARRIERS.

George W. Chidsey, Elmira, N. Y., first prize, $5.
J. S. Giles, Apalachin, N. Y., second prize, $3.

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COLLECTIONS OF FANCY PIGEONS.

George W. Chidsey, Elmira, N. Y., first prize, $5.
J. S. Giles, Apalachin, N. Y., second prize, $3.

COLLECTIONS OF TOY PIGEONS.

George W. Chidsey, Elmira, N. Y., first prize, $5.

LOP-EARED OR MADAGASCAR RABBITS — BUCKS OF ANY COLOUR.

George W. Chidsey, Elmira, N. Y., first prize, $3.

DOES OF ANY COLOUR.

George W. Chidsey, Elmira, N. Y., first prize, $3.

SELF-COLOURED BUCKS.

George W. Chidsey, Elmira, N. Y., first prize, $3.

SELF-COLOURED DOES.

George W. Chidsey, Elmira, N. Y., first prize, $3.

COMMON RABBITS — BUCKS.

William H. Underwood, Homer, N. Y., first prize, $2.
C. L. G. Blessing, Slingerlands, N. Y., second prize, $1.

COMMON RABBITS — DOES.

C. L. G. Blessing, Slingerlands, N. Y., first prize, $2.

INCUBATORS IN OPERATION.

A. M. Halsted, Rye, N. Y., first prize, $10.
Frank Rosebrook, Elmira, N. Y., second prize, $5.

ARTIFICIAL MOTHERS.

A. M. Halsted, Rye, N. Y., first prize, $10.
Frank Rosebrook, Elmira, N. Y., second prize, $5

IMPLEMENTS AND MACHINES.

STEAM FIRE ENGINES — FIRST CLASS.

The La France Manufacturing Co., Elmira, N. Y., bronze medal; the La France rotary steam fire engine, 600 lbs., $4,800.

POWERS OTHER THAN STEAM.

Carley Water-Wheel Co., Cortland, N. Y., certificate of high merit; Carley's turbine water-wheels.
Marshall Wind Engine and Pump Co., Marshall, Mich., certificate of high merit; wind engine.

EXTRA AWARDS.

Charles A. Sands, Cobleskill, N. Y., certificate of merit.; improved hop dryer.
Charles A. Sands, Cobleskill, N. Y., certificate of merit; improved hop pole.
Saxton & Amidon, Buffalo, N. Y., certificate of high merit; Harris' farm truck, 50 lbs., $6.
H. C. Wilber, Campbell, N. Y., certificate of high merit; Davis' patent stone and stump extractor.

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HAY AND CATTLE SCALES.

Jones' Scale Works, Binghamton, N. Y., bronze medal; five-ton waggon scale, all iron and steel, brass beam, $50.

FANNING MILLS.

James Bradner, Pine Creek, N. Y., bronze medal; New York separator and bagger, $80.

MACHINES FOR SEPARATING, CLEANING AND ASSORTING GRAIN.

James Bradner, Pine Creek, N. Y., bronze medal; New York separator and bagger, $40.

CORN-HUSKING MACHINES.

J. Van Zandt, Schenectady, N. Y., bronze medal; power corn-husking machine, capacity from forty to sixty bushels per hour, $130.

BUCKWHEAT SCOURERS.

D. D. Brewster & Sons, Unadilla, N. Y., bronze medal; Brewster's improved buckwheat refiner, 600 pounds, $250.

George H. Kendall, Franklindale, Pa., bronze medal; for steam power, $100.

APPLE GRINDERS FOR POWER.

Boomer & Boschert Press Co., Syracuse, N. Y., bronze medal; apple grater, 300 pounds, $60.

HAND AND POWER PRESSES.

Boomer & Boschert Press Co., Syracuse, N. Y., bronze medal; cider press with power attachment and double platform, 3,000 pounds, $300.

P. K. Dederick & Co., Albany, N. Y., bronze medal; belt, perpetual hay press, $350.

Charles A. Sands, Cobleskill, N. Y., bronze medal; improved hop press.

PUMPS FOR FARM USE.

Onondaga Pump Co., Syracuse, N. Y., certificate of merit; force pumps.

James D. Shoot, Horseheads, N. Y., bronze medal; rubber valve chain pump, 100 pounds, first ten feet $1 per foot, each additional foot 40 cents.

Westfall & Denny, Buffalo, N. Y., bronze medal; Genesee Valley force pump, No. 2, single acting, $15.

EXTRA AWARDS.

American Drier Co., Chambersburg, Pa., certificate of high merit; portable fruit drier or pneumatic evaporator, for drying, dessicating or evaporating fruits, vegetables, etc., 2,250 pounds, $60.

Tonawanda Pipe Co., Tonawanda, N. Y., certificate of high merit for wooden tubes for water pumps, gas, etc.

S. W. Hall, Elmira, N. Y., certificate of merit for fencing machine, with specimens of farm fence.

DAIRY IMPLEMENTS — CHURNS FOR LARGE DAIRIES.

Runner & Purcell, Auburn, N. Y., bronze medal; Sprague churn No. 5, capacity 65 gallons, $75; No. 4, 35 gallons, $45; No. 3, 20 gallons, $20.

CHURNS FOR SMALL DAIRIES.

Dairy Supply Co., New York, N. Y., bronze medal; Campbell's Monitor churn, three sizes.

BUTTER WORKERS.

Howell & Cole, Horseheads, N. Y., bronze medal; 50 pounds, $3.

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MILK COOLERS.

Palmer & Turrell, Elmira, N. Y., bronze medal; Stickle's patent milk pans and cooler, $45 and $120.

MILK PANS FOR CREAMERIES.

Oakes & Calver, Cattaraugus, N. Y., bronze medal; Common Sense milk pan and cooler, 400 pounds, 14 feet by 26 inches, $100.

MILK PANS, METAL.

J. H. Scott, Moravia, N. Y., bronze medal.

PAILS OR FIRKINS FOR TRANSPORTING BUTTER IN HOT WEATHER.

Hubbell Chesebro, Geddes, N. Y., bronze medal; Chesebro's stone butter package, air-tight, eight sizes for 2½ to 5½ pounds, $3 to $18 per dozen.

EXHIBITIONS OF CARPENTERS' AND MECHANICS' TOOLS.

Beadle, Palmer & Co., Elmira, N. Y., bronze medal.

Saxten & Amidon, Buffalo, N. Y., bronze medal; display of bits, braces and carpenters' tools generally.

WIRED BROOMS.

Pratt & Co., Elmira, N. Y., bronze medal.

TWINE-TIED BROOMS.

Pratt & Co., Elmira, N. Y., bronze medal.

EXTRA AWARDS.

Goodell Company, Antrim, N. Y., certificate of merit for Pearce's improved Cahoon's patent broadcast seed sower, for sowing all kinds of grain and seed by hand, 5½ pounds, $6.

Albert Hoag, Grand Isle, Vt., certificate of merit for Hoag's improved hand corn and bean planter.

A. B. Lain, Canisteo, N. Y., certificate of merit for barrel lifting machine, 6 to 8 pounds, $1.50 to $2.

Hiram B. Rhyner, Elmira, N. Y., certificate of high merit for block for cutting files and for samples of files.

WAGGONS, CARRIAGES, SADDLERY AND ARTICLES OF WHEELWRIGHTS' AND BLACKSMITHS' WORK — ROCKAWAY WAGGONS.

Cortland Wagon Manufacturing Co., Cortland, N. Y., bronze medal; standing top, four seats, $140.

PARK PHÆTONS.

Cortland Wagon Manufacturing Co., Cortland, N. Y., bronze medal; extension top, four seats, $300.

ROAD WAGGONS — FOUR SEATS.

Watertown Spring Wagon Co., Watertown, N. Y., bronze medal; family pleasure waggon, platform springs, 425 pounds, $175.

OPEN WAGGONS — TWO SEATS.

John C. Seeley, Elmira, N. Y., bronze medal; 200 pounds, $175.

TOP WAGGONS — TWO SEATS.

John C. Seeley, Elmira, N. Y., bronze medal; light, top, side-bar waggon.

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BUSINESS WAGGONS.

Cortland Wagon Manufacturing Co., Cortland, N. Y., certificate of high merit for business and delivery waggon, panel body, $110.

Cortland Wagon Manufacturing Co., Cortland, N. Y., bronze medal; plain body, four seats, $90.

Watertown Spring Wagon Co., Watertown, N. Y., certificate of high merit; heavy market waggon with platform springs, 450 pounds, $160.

DOUBLE SLEIGHS.

James Ewing, Elmira, N. Y., bronze medal; 160 pounds, $230.

DOUBLE FARM WAGGONS.

Davis Iron Wheel Co., Elmira, N. Y., bronze medal; wheels all iron and steel, 1,000 pounds, $100.

CARRIAGE HARNESSES.

C. H. Wheadon & Son, Elmira, N. Y., bronze medal.

MEN'S SADDLES.

C. H. Wheadon & Son, Elmira, N. Y., bronze medal.

EXTRA AWARDS.

William Corris & Co., Rochester, N. Y., certificate of high merit for sulky wood work.

Davis Iron Wheel Co., Elmira, N. Y., certificate of high merit for iron and steel waggon wheels.

Empire Cross Spring Co., Hornellsville, N. Y., certificate of merit for Empire cross spring gear, 90 pounds, $28.

Fish Brothers, Racine, Wis., bronze medal for exhibition of farm waggons.

Watertown Spring Wagon Co., Watertown, N. Y., certificate of high merit for three-seated platform spring waggon, 450 pounds, $160.

W. F. Whitney, & Co., Poughkeepsie, N. Y., certificate of high merit for the Whitney side-bar springs, to be used with or without half springs, weight per set 7 to 15 pounds, $10.

Beadle, Palmer & Co., Elmira, N. Y., certificate of high merit for scroll saws, shelf hardware, etc.

Constantine Bentley, Elmira, N. Y., certificate of merit for fine exhibition of wire goods.

Clark & Smith, Chester, N. Y., certificate of merit for burglar-proof sash locks and tighteners, $1.75 to $3 per dozen.

John H. Coleman, New York, certificate of merit for Coleman's elevated swinging cans for the safe transporting and easy handling of all kinds of liquids, five sizes.

Holmes & Manwaring, Elmira, N. Y., certificate of merit for spring beds and bed springs.

Kellogg & Johnson, Elmira, N. Y., certificate of high merit for Smead's self-measuring oil can, capacity one barrel and upwards, $30 and upwards.

Henry McShane & Co., Baltimore, Md., certificate of high merit for large church bell, rotary yoke, with complete mountings, 2,053 pounds, $560.

Peart Brothers, Corning, N. Y., certificate of high merit for samples of the Corning liquid paints.

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Levi S. Shoeffler, Elmira, N. Y., certificate of high merit for flexible wooden carpet made of strips of wood wired together, walnut and ash, $1.40 per square yard; cherry and ash, $1.20.

Sidney Shephard & Co., Buffalo, N. Y., certificate of merit for Graham's adjustable stove pipes.

FARM PRODUCE.

GRANGES' WAGGON-LOADS OF FARM PRODUCE, ETC. SPECIAL PRIZES OFFERED BY THE CHEMUNG COUNTY AGRICULTURAL SOCIETY — $100, $75, $50 AND $25.

Horsehead Grange, Horseheads, N. Y., silver medal and first prize, $100.

Chemung Valley Grange, Elmira, N. Y., second prize, $75.

Newtown Grange, 247 Breesport, N. Y., third prize, $50.

GRAIN, SEEDS, HOPS — GROWN IN 1878.

WHITE WINTER WHEAT.

W. P. Ottley, Phelps, N. Y., first prize, $10.

John E. Walcott, Caton Centre, N. Y., second prize, $5; Clawson.

RED WINTER WHEAT.

Edward Crofut, Millport, N. Y., first prize, $10; Fultz.

Henry Schoonmaker, Cedar Hill, N. Y., second prize, $25; red amber.

SPRING WHEAT.

George Chamberlain, Southport, N. Y., first prize, $10.

RYE.

A. Donald, Horseheads, N. Y., first prize, $10.

Henry Schoonmaker, Cedar Hill, N. Y., second prize, $5; white Michigan.

WHITE OATS.

Thomas Bros., Franklinville, N. Y., first prize, $10.

Henry Schoonmaker, Cedar Hill, N. Y., second prize, $5.

BLACK OR GRAY OATS.

George Chamberlain, Southport, N. Y., first prize, $10.

TWO-ROWED SPRING BARLEY.

George Chamberlain, Southport, N. Y., first prize, $10.

FOUR-ROWED SPRING BARLEY.

George J. Frost, Havana, N. Y., first prize, $10.

E. J. Young, Horseheads, N. Y., second prize, $5.

YELLOW INDIAN CORN (SHELLED).

George Chamberlain, Southport, N. Y., first prize, $10.

FIELD BEANS (SMALL).

Howland Evans, Horseheads, N. Y., second prize, $5.

FIELD PEAS (LARGE).

George Chamberlain, Southport, N. Y., first prize, $10.

FIELD PEAS (SMALL).

George Chamberlain, Southport, N. Y., second prize, $5.

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BUCKWHEAT.

A. D. Griswold, Southport, N. Y., first prize, $5.
Tillinghast Bros., Factoryville, Pa., second prize, $3.

MILLET.

A. W. Smith, Cuba, N. Y., first prize, $5.
C. S. Smith, Cuba, N. Y., second prize, $3.

FLAX SEED.

A. H. Prince, Catherina, N. Y., first prize, $5.

SORGHUM SEED.

Tillinghast Bros., Factoryville, Pa., first prize, $5.
George Chamberlain, Southport, N. Y., second prize, $3.

TWENTY-FIVE SEED EARS YELLOW CORN (EIGHT-ROWED).

Morgan Decker, Owego, N. Y., first prize, $5.
W. P. Ottley, Phelps, N. Y., second prize, $3.

TWENTY-FIVE SEED EARS YELLOW CORN (TWELVE-ROWED).

Morgan Decker, Owego, N. Y., first prize, $5.
George Chamberlain, Southport, N. Y., second prize, $3.

TWENTY-FIVE SEED EARS EARLY SWEET CORN.

David Bentley, Southport, N. Y., first prize, $5.
W. A. Ward, Elmira, N. Y., second prize, $3.

TWENTY-FIVE SEED EARS LATE SWEET CORN.

James E. Suffern, Elmira, N. Y., first prize, $5.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $3

BALES OF HOPS.

George Maby, Elmira, N. Y., first prize, $10.

EXTRA AWARDS.

Blackmar & Allerton, Newark, N. Y., samples of oil of peppermint, highly commended.
A. C. Suffern, Elmira, N Y., one bushel of clover seed, commended.
George Chamberlain, Southport, N. Y., a fine specimen of leaf tobacco, commended.

VEGETABLES.

CELERY.

George Chamberlain, Southport, N. Y., first prize, $3.
A. Donald, Horseheads, N. Y., second prize, $2.

CABBAGES.

George Chamberlain, Southport, N. Y., first prize, $3.
H. L. Shappee, Southport, N. Y., second prize, $2.

LETTUCE.

C. L. G. Blessing, Slingerlands, N. Y., first prize, $3.
George Chamberlain, Southport, N. Y., second prize, $2.

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TURNIPS.

George Chamberlain, Southport, N. Y., second prize, $2.

MANGOLDS.

W. A. Ward, Elmira, N. Y., first prize, $3.
Samuel M. Tubbs, Elmira, N. Y., second prize, $2.

BEETS.

Tillinghast Brothers, Factoryville, Pa., first prize, $3.
George Chamberlain, Southport, N. Y., second prize, $2.

ORANGE CARROTS.

A. Donald, Horseheads, N. Y., first prize, $3.
George Chamberlain, Southport, N. Y., second prize, $2.

WHITE CARROTS.

George Chamberlain, Southport, N. Y., first prize, $3.
A. Donald, Horseheads, N. Y., second prize, $2.

PARSNIPS.

George Chamberlain, Southport, N. Y., first prize, $3.
A. Donald, Horseheads, N. Y., second prize, $2.

SALSIFY.

A. Donald, Horseheads, N. Y., first prize, $3.
George Chamberlain, Southport, N. Y., second prize, $2.

KOHL-RABI.

George Chamberlain, Southport, N. Y., first prize, $3.
A. Donald, Horseheads, N. Y., second prize, $2.

ONIONS.

George Chamberlain, Southport, N. Y., first prize, $3.
Tillinghast Brothers, Factoryville, Pa., second prize, $2

TOMATOS.

H. L. Shappee, Southport, N. Y., first prize, $3.
A. Donald, Horseheads, N. Y., second prize, $2.

EGG PLANTS.

George Chamberlain, Southport, N. Y., first prize, $3.
A. Donald, Horseheads, N. Y., second prize, $2.

GARDEN BEANS.

Tillinghast Brothers, Factoryville, Pa., first prize, $3.
R. Llewellyn Moss, Elmira, N. Y., second prize, $2.

PEPPERS.

Tillinghast Brothers, Factoryville, Pa., first prize, $3.
H. L. Shappee, Southport, N. Y., second prize, $2.

SQUASHES.

George Chamberlain, Southport, N. Y., first prize, $3.
Tillinghast Brothers, Factoryville, Pa., second prize, $2.

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SWEET POTATOES.

Tillinghast Brothers, Factoryville, Pa., first prize, $3.
Herbert T. Wickham, Big Flats, N. Y., second prize, $2.

POTATOES, COLLECTIONS OF EARLY VARIETIES.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $10.
Tillinghast Brothers, Factoryville, Pa., second prize, $5.

POTATOES, COLLECTIONS OF LATE VARIETIES.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $10.
Tillinghast Brothers, Factoryville, Pa., second prize, $5.

POTATOES, COLLECTIONS OF STOCK-FEEDING VARIETIES.

Tillinghast Brothers, Factoryville, Pa., first prize, $10.
C. L. G. Blessing, Slingerlands, N. Y., second prize, $5.

COLLECTIONS OF VEGETABLES GROWN BY THE EXHIBITOR, AT LEAST SEVENTY-FIVE VARIETIES.

George Chamberlain, Southport, N. Y., first prize, $25.

BUTTER.

PACKAGES OF BUTTER MADE IN JUNE.

William F. Ford, West Davenport, N. Y., first prize, $20.
H. C. Hoffman, Horseheads, N. Y., second prize, $15.
S. B. Douglass, Reed's Corners, N. Y., third prize, $10.

BUTTER MADE AT ANY TIME.

Morgan Decker, Owego, N. Y., first prize, $20.
L. C. Gardner, Fayetteville, N. Y., second prize, $15.
S. B. Douglass, Reed's Corners, N. Y., third prize, $5.

FIVE ONE-POUND ROLLS.

L. C. Gardner, Fayetteville, N. Y., first prize, $10.
Miss Margaret Neish, Elmira, N. Y., second prize, $5.

CHEESE.

AMERICAN CHEESES OVER ONE YEAR OLD, AND NOT LESS THAN TWENTY POUNDS IN WEIGHT.

J. J. Towle, Stockton, N. Y., first prize, $20.
W. H. Spooner, Walworth, N. Y., second prize, $15.

AMERICAN CHEESES LESS THAN ONE YEAR OLD, AND NOT LESS THAN TWENTY POUNDS IN WEIGHT.

J. R. Holden, Franklinville, N. Y., first prize, $20.
S. B. Douglass, Reed's Corners, N. Y., second prize, $15.

FIVE IMITATION ENGLISH CHEESES.

C. P. Root, Gilbertsville, N. Y., first prize, $10.

IMITATION OF STILTON CHEESE.

W. H. Spooner, Walworth, N. Y., first prize, $10.
Clear Spring Cheese Factory, Fredonia, N. Y., second prize, $5.

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RENNETS.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $10.
Mrs. C. M. Stone, Blossvale, N. Y., second prize, $5.

BREAD, SUGAR, ETC.

WHEATEN BREAD.

S. B. Douglass, Reed's Corners, N. Y., first prize, $5.
Jesse Owen, Chemung, N. Y., second prize, $3.

RYE BREAD.

Samuel Taylor, Elmira, N. Y., first prize, $5.
Mrs. W. H. Graves, Blossvale, N. Y., second prize, $3.

INDIAN OR RYE AND INDIAN BREAD.

Samuel Taylor, Elmira, N. Y., first prize, $5.
Mrs. W. H. Graves, Blossvale, N. Y., second prize, $3.

MAPLE SUGAR.

G. M. Card, Sylvania, Pa., first prize, $5.
Wm. F. Ford, West Davenport, N. Y., second prize, $3.

MAPLE SYRUP.

Wm. F. Ford, West Davenport, N. Y., first prize, $5.
George A. Gladden, Napoli, N. Y., second prize, $3.

PRESERVED FRESH FRUITS.

Howland Evans, Horseheads, N. Y., first prize, $5.
Mrs. D. G. Eacker, Havana, N. Y., second prize, $3.

PICKLES IN VINEGAR.

George Chamberlain, Southport, N. Y., first prize, $5.
George C. Wickham, Havana, N. Y., second prize, $3.

DRIED APPLES.

George C. Wickham, Havana, N. Y., first prize, $5.
George Chamberlain, Southport, N. Y., second prize, $3.

DRIED PEACHES.

George C. Wickham, Havana, N. Y., first prize, $5.

DRIED WHORTLEBERRIES.

Mrs. C. Berk, Fassetts, Pa., first prize, $5.
Mrs. C. M. Stone, Blossvale, N. Y., second prize, $3.

DRIED RASPBERRIES.

Mrs. John T. Griffiths, Millport, N. Y., first prize, $5.
Mrs. W. H. Graves, Blossvale, N. Y., second prize, $3.

BOX HONEY.

P. Peckham, Columbia Cross Roads, Pa., first prize, $5.
E. B. Billings, Elmira, N. Y., second prize, $3.

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EXTRACTED OR STRAINED HONEY.

C. W. Canfield, Athens, Pa., first prize, $5.
E. B. Billings, Elmira, N. Y., second prize, $3.

EXTRA AWARDS.

American Drier Co., Chambersburg, Pa., certificate of high merit for display of evaporated and conserved fruits, berries, vegetables, etc.

DOMESTIC MANUFACTURES.

ALL-WOOL HORSE BLANKETS.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $5.
Mrs. W. H. Graves, Blossvale, N. Y., second prize, $3.

WOOLEN CLOTH.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $5.

WOOLEN FLANNEL

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $5.

FLANNEL WITH COTTON WARP.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $5.
Mrs. C. Berk, Fassetts, Pa., second prize, $3.

LINSEY WOOLSEY.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $5.

COTTON AND WOOL KERSEY.

Mrs. C. M. Stone, Blossvale, N. Y., second prize, $3.

WOOLEN CARPET.

Mrs. C. Berk, Fassetts, Pa., first prize, $5.
James A. Wheeler, Pine Valley, N. Y., second prize, $3.

RAG CARPET.

Mrs. George H. Humphrey, Breesport, N. Y., first prize, $5.
Isaac S. Eastabrook, Catharine, N. Y., second prize, $3.

HEARTH RUGS.

Mrs. R. E. Moss, Elmira, N. Y., first prize, $5.
A. D. Mills, West Elmira, N. Y., second prize, $3.

DOUBLE CARPET COVERLETS.

Mrs. C. Berk, Fassetts, Pa., first prize, $5.

LINEN CLOTH.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $5.

LINEN KERSEY.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $5.

TOW CLOTH.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $5.

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LINEN BAGGING.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $5.

KNIT BED SPREADS.

Miss Hannah V. Rockwell, Elmira, N. Y., first prize, $3.
Mrs. Henry Hill, Southport, N. Y., second prize, $2.

WHITE WORKED OR QUILTED BED SPREADS.

F E. Young, Corning, N. Y., first prize, $3.
Mrs. John W. Hathorn, Elmira, N. Y., second prize, $2.
Miss H. J. Van Horne, Fonda, N. Y., certificate of highest merit.
Mrs. John W. Hathorn, Elmira, N. Y., certificate of merit.

BALMORAL PETTICOATS.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $3.
Mrs. C. M. Stone, Blossvale, N. Y., second prize, $2.

WOOLEN KNIT STOCKINGS.

James A. Wheeler, Pine Valley, N. Y., first prize, $3.
David Turner, Horseheads, N. Y., second prize, $2.

WORSTED KNIT STOCKINGS.

Cheney P. Whitney, Orleans, N. Y., first prize, $3.

WOOLEN KNIT MITTENS.

Mrs. M. Hovey, Rochester, N. Y., first prize, $3.
Mrs. George H. Humphrey, Breesport, N. Y., second prize, $2.

WOOLEN FRINGE MITTENS.

Mrs. M. Hovey, Rochester, N. Y., first prize, $3.
Mrs. N. D. Smith, Farmersville, N. Y., second prize, $2.

LINEN OR COTTON KNIT STOCKINGS.

Mrs. M. C. Turner, Horseheads, N. Y., first prize, $3; linen.
Mrs. Emeline Tillman, Elmira, N. Y., second prize, $2.

LINEN SEWING THREAD.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $3.

EXTRA AWARDS.

Mrs. John Beckwith, Elmira, N. Y., certificate of merit for white quilted bed spread.
Miss Louise Cromwell, Horseheads, N. Y., certificate of merit for lap robe.
Mrs. Louise L. Dayton, Elmira, N. Y., certificate of merit for oil painting on cloth and velvet.
Miss Carrie Erbacherer, Wellsburgh, N. Y., certificate of highest merit for worsted work in frame.
Mrs. John W. Hathorn, Elmira, N. Y., certificate of merit for knit bead toilet set.
Charles Hoppe, Elmira, N. Y., certificate of merit for case of hair work.
Mrs. E. McKinstry, Elmira, N. Y., certificate of merit for worsted hand-wrought stand cover.
Mrs. N. D. Smith, Farmersville, N. Y., certificate of merit for pair hand-embroidered pillow shams.

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Mrs. James E. Suffern, Elmira, N. Y., certificates of merit for sofa pillow cover and stand lambrequin.
James A. Wheeler, Pine Valley, N.Y., certificate of merit for skein of woolen yarn.
Mrs. Peter C. Young, Elmira, N.Y., certificate of highest merit for guipure lace.

FLOWERS, PLANTS AND FRUITS.

Flowers — Professional List — Collections of Cut Flowers.

James Vick, Rochester, N. Y., first prize, $10.
Grove P. Rawson, Elmira, N. Y., second prize, $5.

Collections of Dahlias.

James Vick, Rochester, N. Y., first prize, $6.
H. C. Green, Elmira, N. Y., second prize, $3.

Twenty-four Dahlias.

James Vick, Rochester, N. Y., first prize, $5.

Twelve Dahlias.

James Vick, Rochester, N. Y., first prize, $3.

American Seedling Dahlias.

James Vick, Rochester, N. Y., first prize, $1.

Collections of Roses.

Ellwanger & Barry, Rochester, N. Y., first prize, $6.
Grove P. Rawson, Elmira, N. Y., second prize, $3.

Twenty-four Roses.

Grove P. Rawson, Elmira, N. Y., first prize, $5.

Twelve Roses.

Grove P. Rawson, Elmira, N. Y., first prize, $3.

Collections of Annual Phloxes.

H. C. Green, Elmira, N. Y., first prize, $5.
James Vick, Rochester, N. Y., second prize, $3.

Twelve Perennial Phloxes.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.
James Vick, Rochester, N. Y., second prize, $3.

Seedling Perennial Phloxes.

James Vick, Rochester, N. Y., first prize, $2.

Collections of Verbenas.

Grove P. Rawson, Elmira, N. Y., first prize, $5.
Mrs. H. D. Wells, Elmira, N. Y., second prize, $3.

Twelve Verbenas.

Grove P. Rawson, Elmira, N. Y., first prize, $3.
H. C. Green, Elmira, N. Y., second prize, $2.

American Seedling Verbenas.

Grove P. Rawson, Elmira, N. Y., first prize, $1.

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COLLECTIONS OF ASTERS.

James Vick, Rochester, N. Y., first prize, $3.
H. C. Green, Elmira, N. Y., second prize, $2.

COLLECTIONS OF CELOSIAS.

James Vick, Rochester, N. Y., first prize, $3.

COLLECTIONS OF LILIES.

Mrs. H. D. Wells, Elmira, N. Y., first prize, $3.
James Vick, Rochester, N. Y., second prize, $2.

COLLECTIONS OF PANSIES.

H. C. Green, Elmira, N. Y., first prize, $3.
Mrs. H. D. Wells, Elmira, N. Y., second prize, $2.

COLLECTIONS OF GLADIOLUS.

James Vick, Rochester, N. Y., first prize, $3.
Grove P. Rawson, Elmira, N. Y., second prize, $2.

TWELVE VARIETIES OF GLADIOLUS.

James Vick, Rochester, N. Y., first prize, $2.
Grove P. Rawson, Elmira, N. Y., second prize, $1.

AMATEUR LIST — COLLECTIONS OF CUT FLOWERS.

Samuel S. Mathews, West Elmira, N. Y., first prize, $10.
Mrs. Emeline Tilman, Elmira, N. Y., second prize, $5.

COLLECTIONS OF DAHLIAS.

Mrs. J. T. Griffiths, Millport, N. Y., first prize, $6.
Samuel S. Mathews, West Elmira, N. Y., second prize, $3.

SIX DAHLIAS.

Samuel S. Mathews, West Elmira, N. Y., first prize, $3

COLLECTIONS OF ROSES.

Mrs. J. T. Griffiths, Millport, N. Y., first prize, $6.
Mrs. Emeline Tillman, Elmira, N. Y., second prize, $3.

COLLECTIONS OF VERBENAS.

Mrs. J. T. Griffiths, Millport, N. Y., first prize, $5.
Samuel S. Mathews, West Elmira, N. Y., second prize, $3.

TWELVE VERBENAS.

Samuel S. Mathews, West Elmira, N. Y., first prize, $3.

COLLECTIONS OF PHLOXES.

Mrs. J. T. Griffiths, Millport, N. Y., first prize, $5.
Archie Love, Elmira, N. Y., second prize, $3.

COLLECTIONS OF ASTERS.

Mrs. J. T. Griffiths, Millport, N. Y., first prize, $3.
Samuel S. Mathews, West Elmira, N. Y., second prize, $2.

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Collections of Pansies.

Mrs. Emeline Tillman, Elmira, N. Y., first prize, $3.
Mrs. J. T. Griffiths, Millport, N. Y., second prize, $2.

Collections of Ten-week Stocks.

Mrs. J. T. Griffiths, Millport, N. Y., first prize, $3.
Archie Love, Elmira, N. Y., second prize, $2.

Collections of Gladiolus.

Mrs. J. T. Griffiths, Millport, N. Y., first prize, $3.

Collections of Everlasting Flowers.

Mrs. J. T. Griffiths, Millport, N. Y., first prize, $3.
Archie Love, Elmira, N. Y., second prize, $2.

Plants, Bouquets, etc., Open to All — Twenty Green-house and Stove Plants.

Mrs. H. D. Wells, Elmira, N. Y., first prize, $10.
Grove P. Rawson, Elmira, N. Y., second prize, $5.

Ten Green-house and Stove Plants.

Grove P. Rawson, Elmira, N. Y., first prize, $5.
Mrs. H. D. Wells, Elmira, N. Y., second prize, $3.

Six Variegated-leaved Plants.

Mrs. H. D. Wells, Elmira, N. Y., first prize, $5.
Grove P. Rawson, Elmira, N. Y., second prize, $3.

One Variegated-leaved Plant.

Grove P. Rawson, Elmira, N. Y., first prize, $2.

Six Fuchsias.

Grove P. Rawson, Elmira, N. Y., first prize, $3.

One Fuchsia.

Grove P. Rawson, Elmira, N. Y., first prize, $2.

One Zonal Pelargonium (single).

Mrs. H. D. Wells, Elmira, N. Y., first prize, $2.

One Zonal Pelargonium (double).

Grove P. Rawson, Elmira, N. Y., first prize, $2.

Twelve Succulents other than Cacti.

Mrs. H. D. Wells, Elmira, N. Y., first prize, $5.

Pairs of Hand Bouquets.

Grove P. Rawson, Elmira, N. Y., first prize, $5.
Ellwanger & Barry, Rochester, N. Y., second prize, $3.

Pairs of Table Bouquets.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.
Grove P. Rawson, Elmira, N. Y., second prize, $3.

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SIX BUTTON-HOLE BOUQUETS.

Grove P. Rawson, Elmira, N. Y., first prize, $3.
Mrs. H. D. Wells, Elmira, N. Y., second prize, $2.

BASKETS OF FLOWERS.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.
H. C. Green, Elmira, N. Y., second prize, $3

PAIRS OF HANGING BASKETS.

Grove P. Rawson, Elmira. N. Y., first prize, $3.
Mrs. H. D. Wells, Elmira, N. Y., second prize, $2.

DINNER TABLE DESIGNS.

Mrs. H. D. Wells, Elmira, N. Y., first prize, $5.
Grove P. Rawson, Elmira, N. Y., second prize, $3.

RUSTIC STANDS.

Grove P. Rawson, Elmira, N. Y., first prize, $5.
Carmi Compton, Elmira, N. Y., second prize, $3.

DISPLAY OF NEWLY INTRODUCED FLOWERS.

Grove P. Rawson, Elmira, N, Y., first prize, $5.
Mrs. H. D. Wells, Elmira, N. Y., second prize, $3.

FRUITS.

PROFESSIONAL LIST — COLLECTIONS OF APPLES.

Ellwanger & Barry, Rochester, N. Y., first prize, $10.

TWENTY VARIETIES OF APPLES.

Ellwanger & Barry, Rochester, N. Y., first prize, $8.

COLLECTIONS OF PEARS.

Ellwanger & Barry, Rochester, N. Y., first prize, $15.

TEN VARIETIES OF PEARS.

O. H. Budd, Hector, N. Y., first prize, $5.

COLLECTIONS OF PEACHES.

O. H. Budd, Hector, N. Y., first prize, $5.

THREE VARIETIES OF PEACHES.

O. H. Budd, Hector, N. Y., first prize, $3.

ONE VARIETY OF PEACHES.

James H. Ricketts, Newburgh, N. Y., first prize, $2.

COLLECTIONS OF PLUMS.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.

FIVE VARIETIES OF PLUMS.

Ellwanger & Barry, Rochester, N. Y., first prize, $3.
O. H. Budd, Hector, N. Y., second prize, $2.

ONE VARIETY OF PLUMS.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

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QUINCES.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

COLLECTIONS OF NATIVE GRAPES.

James H. Ricketts, Newburgh, N. Y., first prize, $10.
Ellwanger & Barry, Rochester, N. Y., second prize, $5.

FIVE VARIETIES OF NATIVE GRAPES.

Ellwanger & Barry, Rochester, N. Y., first prize, $3.
O. H. Budd, Hector, N. Y., second prize, $2.

COLLECTIONS OF FOREIGN GRAPES.

Ellwanger & Barry, Rochester, N. Y., first prize, $10.

FIVE VARIETIES OF FOREIGN GRAPES.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.

DISH OF FOREIGN GRAPES (WHITE).

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

DISH OF FOREIGN GRAPES (BLACK).

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

AMATEUR LIST — TWENTY VARIETIES OF APPLES.

John Van Dorn, Ithaca, N. Y., first prize, $10.
J. S. Giles, Apalachin, N. Y., second prize, $5.

TEN VARIETIES OF APPLES.

John Van Dorn, Ithaca, N. Y., first prize, $5.
George C. Wickham, Havana, N. Y., second prize, $3.

FIVE VARIETIES OF APPLES.

John Van Dorn, Ithaca, N. Y., first prize, $3.
J. S. Giles, Apalachin, N. Y., second prize, $2.

TEN VARIETIES OF PEARS.

G. E. Adriance, Hector, N. Y., first prize, $5.
Mrs. J. T. Griffiths, Millport, N. Y., second prize, $3.

FIVE VARIETIES OF PEARS.

W. A. Wells, Elmira, N. Y., first prize, $3.
M. C. Baldwin, Chemung, N. Y., second prize, $2.

ONE VARIETY OF PEACHES.

G. E. Adriance, Hector, N. Y., first prize, $2.
Samuel S. Mathews, West Elmira, N. Y., second prize, $1.

FIVE VARIETIES OF PLUMS.

Wm. J. Chapman, Hartford, N. Y., first prize, $3.
G. E. Adriance, Hector, N. Y., second prize, $2.

THREE VARIETIES OF PLUMS.

G. E. Adriance, Hector, N. Y., first prize, $2.
Wm. J. Chapman, Hartford, N. Y., second prize, $1.

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QUINCES.

Carl Massig, Havana, N. Y., first prize, $2.

TEN VARIETIES OF NATIVE GRAPES.

G. E. Adriance, Hector, N. Y., first prize, $6.

FIVE VARIETIES OF NATIVE GRAPES.

G. E. Adriance, Hector, N. Y., first prize, $3.

FIVE VARIETIES OF FOREIGN GRAPES.

A. S. Diven, Elmira, N. Y., first prize, $6.

ONE VARIETY OF FOREIGN GRAPES.

A. S. Diven, Elmira, N. Y., first prize, $3.

FRUITS — SINGLE DISHES — OPEN TO ALL

APPLES — FALL PIPPINS.

J. A. Haddock, Havana, N. Y., first prize, $2,

GRAVENSTEIN.

Ellwanger & Barry, Rochester, N. Y., first prize, $2

BALDWIN

J. A. Haddock, Havana, N. Y., first prize, $2

KING OF TOMPKINS COUNTY.

W. W. Albro, Elmira, N. Y., first prize, $2.

NORTHERN SPY

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

RHODE ISLAND GREENING.

Ellwanger & Barry, Rochester, N. Y., first prize, $2

ROXBURY RUSSET.

C. L. G. Blessing, Slingerlands, N. Y., first prize, $2.

TWENTY OUNCE.

G. C. Wickham, Havana, N. Y., first prize, $2

ESOPUS SPITZENBERG.

C. L. G. Blessing, Slingerlands, N. Y., first prize, $2.

PEARS — BARTLETT.

Carl Massig, Havana, N. Y., first prize, $2.

BEURRE D'ANJOU.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

BEURRE CLAIRGEAU.

William J. Chapman, Hartford, N. Y., first prize, $3.

BEURRE BOSC.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

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DUCHESSE D'ANGOULEME.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

DOYENNE BOUSSOCK.

Ellwanger & Barry, Rochester, N. Y. first prize, $3.

FLEMISH BEAUTY.

William J. Chapman, Hartford, N. Y., first prize, $2

SECKEL.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

SHELDON.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

LAWRENCE.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

WINTER NELIS.

J. A. Haddock, Havana, N. Y., first prize, $2.

GRAPES (CONCORD).

J. A. Haddock, Havana, N. Y., first prize, $2.

CATAWBA.

J A. Haddock, Havana, N. Y., first prize, $2.

DELAWARE.

G. E. Adriance, Hector, N. Y., first prize, $2.

HARTFORD.

J. A. Haddock, Havana, N. Y., first prize, $2.

ISABELLA.

Carl Massig, Havana, N. Y., first prize, $2.

AWARDS.

At the Thirty-ninth Annual Cattle Show and Fair of the New York State Agricultural Society, held at Utica, September 8th to September 12th, 1879.

CATTLE.

SHORTHORNS — SHORTHORN HERD PRIZE.

Thomas L. Harison, Morley, N. Y., large gold medal.

Bull, Eighth Baron Morley, red and white, bred by exhibitor, calved December 12, 1874, sire Saladin (35461), dam Tuberose 40 by Zanoni (37700), gr. d. Tuberose 4th by Wolviston (21125).

Cow, Bonny Red Rose 2nd, red and white, bred by Avery & Murphy, Detroit, Mich., calved October 12, 1874, sire Twenty-third Duke of Airdrie 19393, dam Bonny Red Rose by Major Duncan 5927, gr. d. Bonny Lass by Master Miller 693.

Heifer, Lady Laura, roan, bred by exhibitor, calved March 9, 1877, sire Eighth

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Baron Morley 28537, dam Lady Fanny by Second Baron Morley 13427, gr. d. Lady Gertrude by Saladin (35461).

Heifer, Salvia 4th, red and white bred by exhibitor, calved March 12, 1877, sire Second Baron Morley 13427, dam Salvia by Saladin 10938, gr. d. Rosalie by Lord Derby 4949.

Heifer, Hannah, roan, bred by exhibitor, calved May 22, 1877, sire Saladin (35461), dam Helena 2nd by Mosstrooper (34877), gr. d. Helena by Lord Oxford (20214).

Heifer, Princess Sale, roan, bred by exhibitor, calved February 22, 1878, sire Eighth Baron Morley 28537, dam Princess of Oxford 3rd by Saladin 10938, gr. d. Princess of Oxford by Earl of Oxford 8072.

BULLS OVER THREE YEARS OLD.

Thomas L. Harison, Morley, N. Y., first prize, $50; Eighth Baron Morley, red and white, bred by exhibitor, calved December 12, 1874, sire Saladin (35461), dam Tuberose 40 by Zanoni (37700), gr. d. Tuberose 4th by Wolviston (21125).

Samuel Campbell, New York Mills, N. Y., second prize, $25; Knightley Duke 2nd, red, bred by exhibitor, calved May 18, 1876, sire Seventh Lord Oxford 17586, dam Lady Knightley 4th by Fourth Duke of Geneva 7931, gr. d. Lady Knightley 2nd by Third Duke of Geneva (23753).

BULLS TWO YEARS OLD.

Daniel B. Haight, Dover Plains, N. Y., first prize, $10; Baron of Brookdale, red. bred by exhibitor, calved March 6, 1877, sire Third Baron of Lyonsdale 18951, dam Lady Mary by Hotspur (31393), gr. d. Baroness by Barrington (30501).

Samuel Campbell, New York Mills, N.Y., second prize, $20; Knightley Duke 3rd, roan, bred by exhibitor, calved March 21, 1877, sire Seventh Lord Oxford 17586, dam Lady Knightley 4th by Fourth Duke of Geneva 7931, gr. d. Lady Knightley 2nd by Third Duke of Geneva (25753).

BULLS ONE YEAR OLD.

Harris Lewis, & Son, Frankfort, N. Y., first prize, $30; Twenty-second Prince of Herkimer, roan, bred by exhibitor, calved April 1, 1878, sire Second Prince of Herkimer 24417, dam Lady Mary of Herkimer by Prince of Herkimer 15211 gr. d. Lady Mary 2nd by Duke of Putney 6686.

T. L. Harison, Morley, N, Y., second prize, $15; Fourteenth Baron Morley, red and white, bred by exhibitor, calved March 16, 1878, sire Eighth Baron Morley 28537, dam Lady Becky by Saladin (35461), gr. d. Rosette by Oxford Lad (24713).

BULL CALVES.

D. B. Haight, Dover Plains, N. Y., first prize, $10; Fourth Baron of Brookdale, red, bred by exhibitor, calved February 25, 1879, sire Baron of Brookdale 28511, dam Lady Mary 10th by Earl of Seaham 8077, gr. d. Lady Mary 2nd by Climax 5453.

D. B. Haight, Dover Plains, N. Y., second prize, $5; Napier, roan, bred by exhibitor, calved January 1, 1879, sire Third Baron of Lyonsdale 18957, dam Red Rose 20th by Mariner 5933, gr. d. Red Rose 7th by Highflyer 578.

COWS OVER THREE YEARS OLD.

T. L. Harison, Morley, N. Y., first prize, $40; Bonny Red Rosé 2nd, red and white, bred by Avery & Murphy, Detroit, Mich., calved October 12, 1874, sire Twenty-third Duke of Airdrie 10393, dam Bonny Red Rose by Major Duncan 5027, gr. d. Bonny Lass by Master Miller 693.

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Benjamin Fellows, Clifton, N. Y., second prize, $20; Niobe 1st, red with a little white, bred by Judson Howard, Mendon, N. Y., calved January 21, 1873, sire Major 10425, dam Niobe by Clifton Duke 2d 7711, gr. d. Nannie Williams 10th by Duke of Airdrie 2743.

HEIFERS TWO YEARS OLD.

T. L. Harison, Morley, N. Y., first prize, $30; Salvia 4th, red and white, bred by exhibitor, calved March 12, 1877, sire Second Baron Morley 13427, dam Salvia by Saladin 10988, gr. d. Rosalie by Lord Derby 4949.

T. L. Harison, Morley, N. Y., second prize, $15; Hannah, roan, bred by exhibitor, calved May 22, 1877, sire Saladin (35461), dam Helena 2nd by Mosstrooper (34877), gr. d. Helena by Lord Oxford (20214)

HEIFERS ONE YEAR OLD.

Benjamin Fellows, Clifton, N. Y., first prize, $30; Niobe 2nd, red, bred by exhibitor, calved March 7, 1878, sire Treble Gloster 7331, dam Niobe 1st by Major 10425, gr. d. Niobe by Clifton Duke 2nd 7711.

Benjamin Fellows, Clifton, N. Y., second prize, $10; Niobe 3rd, red, bred by exhibitor, calved March 25, 1878, sire Treble Gloster 7331, dam Niobe by Clifton Duke 2nd 7711, gr. d. Nannie Williams 10th by Duke of Airdrie 2743.

HEIFER CALVES.

Benjamin Fellows, Clifton, N. Y., first prize, $10; Prairie Bell, red with white marks, calved October 24, 1878, bred by exhibitor, sire Treble Gloster 7331, dam Prairie Blossom by Royal Crown 10916, gr. d. Prairie Lass by Scotchman 7253.

Daniel B. Haight, Dover Plains, N. Y., second prize, $5; Constance of Brookdale 3rd, red and white, bred by exhibitor, calved September 10, 1878, sire Third Baron of Lyonsdale 18967, dam Constance 5th by Earl of Seaham 8077, gr. d. Constance 3rd by Clifton Duke (23580).

DEVONS — DEVON HERD PRIZE.

Joseph Hilton, New Scotland, N. Y., large gold medal.

Bull Crown Prince, bred by exhibitor, calved November 25, 1875, sire Prince of Wales 652, dam Edith 6th by Prince of Wales 652, gr. d. Edith 3rd by Sachem (517).

Cow Fanny, bred by exhibitor, calved November 10, 1871, sire Prince of Wales 652, dam Edith 3rd by Sachem (517), gr. d. Edith, imported by Lewis G. Morris.

Cow Edith 6th, bred by exhibitor, calved November 5, 1872, sire Prince of Wales 652, dam Edith 3rd by Sachem (517), gr. d. Edith, imported by Lewis G. Morris.

Cow Edith 12th, bred by exhibitor, calved December 13, 1875, sire Prince of Wales 652, dam Edith 4th by Prince of Wales 652, gr. d. Edith 2nd by Sachem (517).

Heifer Belle 11th, bred by exhibitor, calved August 23, 1877, sire Prince of Wales 11th 1025, dam Belle 5th by Prince of Wales 652, gr. d. Belle 4th by Prince of Wales 652.

Heifer Edith 13th, bred by exhibitor, calved December 11, 1877, sire Prince of Wales 11th 1025, dam Edith 7th by Prince of Wales 652, gr. d. Edith 2nd by Sachem (517).

BULLS OVER THREE YEARS OLD.

Joseph Hilton, New Scotland, N. Y., first prize, $50; Crown Prince, bred by exhibitor, calved November 25, 1875, sire Prince of Wales 652, dam Edith 6th by Prince of Wales 652, gr. d. Edith 3rd by Sachem (517).

Walter Cole, Batavia, N. Y., second prize, $25; Cole's Puritan 3rd, bred by

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exhibitor, calved February 21, 1875, sire Lovely's Huron 3rd 591, dam Helena 34th by Iroquois 564, gr. d. Helena 33rd by Comet 22.

BULLS TWO YEARS OLD.

A. F. Bronson, Vernon, N. Y., second prize, $20; Lord Nelson 2nd, bred by Truman Baker, Earlville, N. Y., calved March 20, 1877, sire Lord Nelson 949½, dam Edith by Chenango 463, gr. d. Alida by Empire (424 H.).

BULLS ONE YEAR OLD.

Walter Cole, Batavia, N. Y., first prize, $30; Wanda's Puritan, bred by exhibitor, calved March 18, 1878, sire Cole's Puritan 2nd 798, dam Wanda 2nd by Queen Anne's Huron 320, gr. d. Lovely 18th by Young Exeter (765).

A. F. Bronson, Vernon, N. Y., second prize, $15; Brant, bred by exhibitor, calved April, 1878, sire Litchfield 947, dam Cherry by Young Baltimore (599 H.), gr. d. Flora by Sir Walter Raleigh (560 H.).

BULL CALVES.

Joseph Hilton, New Scotland, N. Y., first prize, $10; Prince of Wales 20th, bred by exhibitor, calved December 12, 1878, sire Crown Prince 809, dam Edith 9th by Prince of Wales 652, gr. d. Fanny by Prince of Wales 652.

A. F. Bronson, Vernon, N. Y., second prize, $5; Oneida, bred by exhibitor, calved March 31, 1879, sire Doctor 819½, dam Flora by Grant 533, gr. d. Tilt by Dandy 191.

COWS OVER THREE YEARS OLD.

Joseph Hilton, New Scotland, N. Y., first prize, $40; Edith 6th, bred by exhibitor, calved November 5, 1372, sire Prince of Wales 652, dam Edith 3rd by Sachem (517), gr. d. Edith, imported by Lewis G. Morris.

Joseph Hilton, New Scotland, N. Y., second prize, $20; Edith 12th, bred by exhibitor, calved December 18, 1875, sire Prince of Wales 652, dam Edith 4th by Prince of Wales 652, gr. d. Edith 2nd by Sachem (517).

HEIFERS TWO YEARS OLD.

Joseph Hilton, New Scotland, N. Y., first prize $30; Belle 11th, bred by exhibitor, calved August 23, 1877, sire Prince of Wales 11th 1025, dam Belle 5th by Prince of Wales 652, gr. d. Belle 4th by Prince of Wales 652.

A. F. Bronson, Vernon, N. Y., second prize, $15; Litchfield Belle, bred by exhibitor, calved February 20, 1877, sire Doctor 819½, dam Flora by Grant 533, gr. d. Tilt by Dandy 191.

HEIFERS ONE YEAR OLD.

Walter Cole, Batavia, N. Y., first prize, $20; Puritan Maid, bred by exhibitor, calved April, 1878, sire Duke of Flitton 9th 838, dam Helena 34th by Iroquois 564, gr. d. Helena 33rd by Comet 22.

A. F. Bronson, Vernon, N. Y., second prize, $10; Belle of Oneida, bred by exhibitor, calved May 6, 1878, sire Doctor 819½, dam Emma by Tasso 848, gr. d. Eva by Bloomfield 169.

HEIFER CALVES.

Joseph Hilton, New Scotland, N. Y., first prize, $10; Edith 17th, bred by exhibitor, calved March 27, 1879, sire Crown Prince 809, dam Edith 6th by Prince of Wales 652, gr. d. Edith 3rd by Sachem (517).

A. F. Bronson, Vernon, N. Y., second prize, $5; Little Buttercup, bred by exhibitor, calved March 1, 1879, sire Doctor 819½, dam Cherry 3rd by Mohawk 610, gr. d. Cherry by Young Baltimore (599) H.

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HEREFORDS — HEREFORD HERD PRIZE.

John Merryman, Hayfields, Md., large gold medal.

Bull Illinois, red, white face, bred by T. L. Miller, Beecher, Ill., calved August 6, 1875, sire Success (5031), dam Kate by John Bull (3885), gr. d. Queen of the West by Merryman (4787).

Cow Giantess, red, white face, bred by John Henry Arkwright, Hampton Green, Herefordshire, England, calved August 26, 1868, sire Sir Oliver 2nd (1733), dam Gay Lass by Riff Raff (1052), gr. d. Gaily by Quicksilver 2nd.

Cow Belle McAlpine, red, white face, bred by exhibitor, calved December 21, 1871, sire Sir Richard 2nd (4984), dam Hatty by Curly (801), gr. d. Miss Tully.

Heifer Etta, red, white face, bred by exhibitor, calved October 27, 1876, sire Canadian (4394), dam Bell McAlpine by Sir Richard 2nd (4984), gr. d. Hattie by Curly (801).

Heifer Princess Charlotte, red, white face, bred by exhibitor, calved April 8, 1877, sire Sir Richard 2nd (4984), dam Giantess by Sir Oliver 2nd (1733), gr. d. Gay Lass by Riff Raff (1052).

Heifer Princess Louise 2nd, red, white face, bred by exhibitor, calved November 10, 1877, sire Sir Richard 2nd (4984), dam Giantess by Sir Oliver 2nd (1733), gr. d. Gay Lass by Riff Raff (1052).

BULLS OVER THREE YEARS OLD.

Erastus Corning, Albany, N. Y., first prize, $50; Comus, red, with white face, bred by Thomas Turner, Pembroke, England, calved July 21, 1872, sire Provost (4067), dam Kathlina by Bolingbroke (1886), gr. d Redwing by Felix (953).

John Merryman, Hayfields, Md., second prize, $25; Illinois, red, white face, bred by T. L. Miller, Beecher, Ill., calved August 6, 1875, sire Success (5031), dam Kate by John Bull (3885), gr. d. Queen of the West by Merryman (4787).

BULLS ONE YEAR OLD.

John Merryman, Hayfields, Md., first prize, $30; Stonie Williams, red, white face, bred by exhibitor, calved August 22, 1878, sire Illinois (5395), dam Belle M'Alpine by Sir Richard 2nd (4984), gr. d. Hattie by Curley (801).

BULL CALVES.

John Merryman, Hayfields, Md., first prize, $10; Duke of Connaught, red, white face, bred by exhibitor, calved November 1, 1878, sire Illinois (5395), dam Princess Victoria by Sir Richard 2nd (4984), gr. d. Giantess by Sir Oliver 2nd (1733).

COWS OVER THREE YEARS OLD.

Erastus Corning, Albany, N. Y., first prize, $40; Victoria 6th, red, with white face, bred by exhibitor, calved June 12, 1874, sire Taurus, dam Victoria 5th by S. Goddard, gr. d. Victoria 4th by Cardinal Wiseman.

Erastus Corning, Albany, N. Y., second prize, $20; Marchioness 2nd, red, with white face, bred by exhibitor, calved April, 1869, sire Major, dam Marchioness by Washington, gr. d. Lady, imported by exhibitor.

HEIFERS TWO YEARS OLD.

John Merryman, Hayfields, Md., first prize, $30; Princess Charlotte, red, white face, bred by exhibitor, calved April 8, 1877, sire Sir Richard 2nd (4984), dam Giantess by Sir Oliver 2nd (1733), gr. d. Gay Lass by Riff Raff (1052).

Erastus Corning, Albany, N. Y., second prize, $15; Topsy Turvy, red, with white

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face, bred by exhibitor, calved March 13, 1877, sire Comus, dam Topsy by Taurus, gr. d. Marchioness 2nd by Major.

HEIFERS ONE YEAR OLD.

John Merryman, Hayfields, Md., first prize, $20; Princess Louise 2nd, red, white face, bred by exhibitor, calved November 10, 1877, sire Sir Richard 2nd (4984), dam Giantess by Sir Oliver 2nd (1733), gr. d. Gay Lass by Riff Raff (1052).

HEIFER CALVES

John Merryman, Hayfields, Md., first prize, $10; Dorcas 2nd, red, white face, bred by exhibitor, calved October 6, 1878, sire Illinois (5395), dam Dorcas by Sir Richard 2nd (4984), gr. d. Agnes by Admiral (2375).

Erastus Corning, Albany, N. Y., second prize, $5; Edna, red, with white face, bred by exhibitor, calved February 9, 1879, sire Comus, imported, dam Victoria 6th by Taurus, gr. d. Victoria 5th by S. Goddard.

AYRSHIRES — AYRSHIRE HERD PRIZE.

James F. Converse, Woodville, N. Y., large gold medal.

Bull, Woodville Chief, white and red, bred by M. Robertson, in Scotland, calved May, 1870, sire General Lee, dam Beauty 2nd.

Cow, Beulah, mostly red, bred by R. Caldwell, in Scotland, calved June, 1869, sire Geordie, dam Queen.

Cow, Peerless, red and white, bred by Robert Orr, in Scotland, calved March, 1871, sire Trump, dam Kitty Clyde.

Cow, Ocean Belle 2nd, red and white, bred by exhibitor, calved April, 1872, sire Woodville Chief 1542, dam Ocean Belle (imported) by Trumpeter, gr. d. Dosh by Doctor.

Heifer, Molly Kimball, red and white spotted, bred by exhibitor, calved November 9, 1877, sire Fearnot 1134, dam Ocean Belle 2nd by Woodville Chief 1542, gr. d. Ocean Belle, imported.

Heifer, Christie, white and red, bred by exhibitor, calved April 22, 1878, sire Gold Dust 2015, dam Miss Clara by Woodville Chief 1542, gr. d. bright Eyes by John Gilpin 2:2.

BULLS OVER THREE YEARS OLD.

Eugene Ham, Verbank, N. Y., first prize, $50; Edgewood, red and white, bred by John R. Stuyvesant, Poughkeepsie, N. Y., calved June 3, 1874, sire 247 Argyle, dam Josephine by 111 Ivanhoe, gr. d. Jessie by 10 Baldy.

Frank D. Curtis, Charlton, N. Y., second prize, $25; Seventy-six, dark red and white, bred by exhibitor, calved July 4, 1876, sire Donald Dinnie 1074, dam Polyanthus by St. Cuthbert 877, gr. d. Marian by Tam 72.

BULLS TWO YEARS OLD.

Eugene Ham, Verbank, N. Y., first prize, $10; McWhirter, red and white, bred by S. M. & D. Wells, Wethersfield, Conn., calved March 6, 1877, sire 824 Fortune, dam Amy by 672 Morton, gr. d. Dolly 3rd by 453 Rob Roy.

BULLS ONE YEAR OLD.

Samuel Campbell, New York Mills, N. Y., first prize, $30; Laird Craigie, red and white, bred by exhibitor, calved March 29, 1878, sire 675 Nappy, dam Lady Clyde, imported by Wolcott & Campbell in 1870.

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James F. Converse, Woodville, N, Y., second prize, $15; Wait and Win, red and white, bred by exhibitor, calved April, 1878, sire Woodville Chief 1542, dam Eyebright by Gen. Grant 176, gr. d. Bright Eyes by John Gilpin, 222.

BULL CALVES.

James F. Converse, Woodville, N. Y., first prize, $10; Camper, red and white, bred by exhibitor, calved November, 1878, sire Woodville Chief 1542, dam Molly Brooks by John Gilpin 222, gr. d. Dewdrop by Kilburn 229.

Samuel Campbell, New York Mills, N. Y., second prize, $5; ——, red and white, bred by exhibitor, calved January 31, 1879, sire 675 Nappy, dam Peggy by 142 Lord Clyde, gr. d. Maggie by 10 Baldy.

COWS OVER THREE YEARS OLD.

James F. Converse, Woodville, N. Y., first prize, $40; Beulah, mostly red, bred by R. Caldwell in Scotland, calved June, 1869, sire Geordie, dam Queen.

Samuel Campbell, New York Mills, N. Y., second prize, $20; Lady Clyde 4th, red and white, bred by exhibitor, calved April 23, 1875, sire 148 Lucknow, dam Lady Clyde, imported by Walcott & Campbell in 1870.

HEIFERS TWO YEARS OLD.

Eugene Ham, Verbank, N. Y., first prize, $30; Madge Morton 3rd, light red and white, bred by exhibitor, calved May 16, 1877, sire 318 Edgewood, dam Madge Morton by 3.8 Gen. Tilton, gr. d. Madge by 109 Irvine.

James F. Converse, Woodville, N. Y, second prize, $15; Jean Woodville, red and white, bred by exhibitor, calved March 30, 1877, sire Pilot 1675, dam Miss Clara by Woodville Chief 1542, gr. d. Bright Eyes by John Gilpin 222.

HEIFERS ONE YEAR OLD.

James F. Converse, Woodville, N. Y., first prize, $20; Christie, white and red, bred by exhibitor, calved April 22, 1878, sire Gold Dust 2015, dam Miss Clara by Woodville Chief 1542, gr. d. Bright Eyes by John Gilpin 222,

James F. Converse, Woodville, N. Y., second prize, $10; Molly Kimball, red and white spotted, bred by exhibitor, calved November 9, 1877, sire Fearnot 1134, dam Ocean Belle 2nd by Woodville Chief 1542, gr. d. Ocean Belle, imported.

HEIFER CALVES.

Eugene Ham, Verbank, N. Y., first prize, $10; Miss Dolly's Daughter, red and white, bred by exhibitor, calved March 16, 1879, sire 318 Edgewood, dam Miss Dolly by 490 Sultan, gr. d. Dolly by 286 Dandy 5th.

Stryker & Jones, Rome, N. Y., second prize, $5; Lady Brown, white and red, bred by exhibitors, calved March 20, 1879, sire Kilmarnock 2nd, dam Spotted Beauty 2nd by 127 Kilmarnock, gr. d. Spotted Beauty by 183 Ploughboy.

HOLSTEINS — HOLSTEIN HERD PRIZE.

Smiths & Powell, Syracuse, N. Y., large gold medal.

Bull, Uncle Tom, black and white, bred by Gerrit S. Miller, Peterboro, N. Y., calved April 17, 1875, sire Rip Van Winkle 35, dam Topsy by Hollander 20, gr. d. Dowager, imported by G. S. Miller.

Cow, Ægis, black and white, bred by Gerrit S. Miller, Peterboro, N. Y., calved October 2. 1873, sire Rip Van Winkle 35, dam Agoo, imported by G. S. Miller.

Cow, Porcelain, white and black, bred by A. D. Goede, in Holland, calved in 1874, imported by exhibitors in 1878.

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Heifer, Sappho, black and white, bred by Gerrit S. Miller, Peterboro, N. Y., calved January 15, 1877, sire Pluto 133, dam Juniata by Rip Van Winkle 35, gr. d. Juno by Hollander 20.

Heifer, Netherland Queen, black and white, bred by A. C. Koning, in Holland, calved March 26, 1877, imported by exhibitors in 1878.

Heifer, Holland Beauty, black and white, bred by A. C. Koning, in Holland, calved April 3, 1877, imported by exhibitors in 1878.

BULLS OVER THREE YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $50; Uncle Tom, black and white, bred by Gerrit S. Miller, Peterboro, N. Y., calved April 17, 1875, sire Rip Van Winkle 35, dam Topsy by Hollander 20, gr. d. Dowager, imported by G. S. Miller.

Stryker & Jones, Rome, N. Y., second prize, $25; Fourth Prince of Orange, black and white, bred by the Oneida Community, Oneida, N. Y., calved February 12, 1876, sire Prince of Orange 138, dam Midwould 15th by Texelaar 6th 44, gr. d. Midwould 2nd by Second Dutchman 37.

BULLS ONE YEAR OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $30; Beaconsfield, black and white, bred by Jan Wortel, in Holland, imported by exhibitors, calved March 25, 1878, sire Kees (52).

H L Brace, West Winfield, N. Y., second prize, $15; Second Lad of Twisk, black and white, bred by the Unadilla Valley Stock Breeders' Association, West Edmeston, N. Y., calved April 3, 1878, sire Burgomaster (27) dam Maid of Twisk, imported.

BULL CALVES.

L. L. Wight, Whitestown, N. Y., first prize, $10; Paul Bleecker, black and white, bred by Unadilla Valley Stock Breeders' Association, calved November 29, 1878, sire Paul Potter, imported, dam Siitje Bleecker, imported.

Smiths & Powell, Syracuse, N. Y., second prize, $5; Farmer Boy, black and white, bred by exhibitors, calved March 19, 1879, sire Uncle Tom 163, dam Holland Beauty, imported by exhibitors.

COWS OVER THREE YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $40; Ægis, black and white, bred by Gerrit S. Miller, Peterboro, N. Y., calved October 2, 1873, sire Rip Van Winkle 35, dam Agoo, imported by G. S. Miller.

Stryker & Jones, Rome, N. Y., second prize, $20; Lea, black and white, bred in North Holland, calved April, 1871, imported by John H. Comer in 1874, sire Wederkind, dam Eva.

HEIFERS TWO YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $30; Netherland Queen, black and white, bred by A. C. Koning, in Holland, calved March 26, 1877, imported by exhibitors in 1878.

Stryker & Jones, Rome, N. Y., second prize. $15; Lea 2nd, black and white, bred by John Stryker, Rome, N. Y., calved January 6, 1877, sire Prince of Orange 138, dam Lea, imported by John H. Comer.

HEIFERS ONE YEAR OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $20; Pride of Friesland, black and white, bred by K. N. Kuperus, in Holland, calved February 20, 1878, imported by exhibitors in 1879.

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H. L. Brace, West Winfield, N. Y., second prize, $10; Dora Bleecker 2nd, black and white, bred by T. E. Whiting, Concord, Mass., calved February 18, 1878, sire Paul Potter (28), dam Dora Bleecker, imported.

HEIFER CALVES.

Smiths & Powell, Syracuse; N. Y., first prize, $10; Juniata 2nd, black and white, bred by exhibitors, calved March 13, 1879, sire Uncle Tom 163, dam Juniata by Rip Van Winkle, 35, gr. d. Juno by Hollander 20.

Stryker and Jones, Rome, N. Y., second prize, $5; Ella, black and white, bred by John Stryker, Rome, N. Y., calved January 28, 1879, sire Fourth Prince of Orange 246, dam Lea 2nd by Prince of Orange 138, gr. d. Lea, imported by John H. Comer.

JERSEYS — JERSEY HERD PRIZE.

John D. Wing, Millbrook, N. Y., large gold medal.

Bull Babylon, solid dark, bred by E. R. Durkee, Babylon, N. Y., calved July 25, 1878, sire Jacob 1377, dam Echo 2nd by Devilshoof 866, gr. d. Echo by Lord Nelson 860.

Cow, Maple Leaf, fawn with some white, bred by exhibitor, calved November 10, 1872, sire Ontario 865, dam Echo by Lord Nelson 860, gr. d. Edith 2nd, by Saturn 94.

Cow, Oak Leaf, dark fawn, bred by exhibitor, calved September 19, 1873, sire Devilshoof 866, dam Echo by Lord Nelson 860, gr. d. Edith 2nd by Saturn 94.

Heifer, Maple Blossom, fawn, bred by exhibitor, calved February 5, 1878, sire Niobe Duke 2364, dam Maple Leaf 2nd by Pagan 1800, gr. d. Maple Leaf by Ontario 865.

Heifer, Hazel Witch, fawn and white, bred by Thos. J. Hand, Sing Sing, N. Y., calved May 3, 1878, sire Medallist 2122, dam Witch Hazel 3rd by Marius 760, gr. d. Witch Hazel by Southampton 117.

Heifer, Empresa 2nd, dark gray, bred by Thos. J. Hand, Sing Sing, N. Y., calved June 11, 1878, sire Lord Lawrence 1414, dam Empresa by Marius 760, gr. d. Emblem, imported.

BULLS OVER THREE YEARS OLD.

Erastus Corning, Albany, N. Y., first prize, $50; Stockwell 3rd, fawn and gray, bred by John A. Godfrey, in Jersey, calved August, 1872, imported by exhibitor.

H. & C. H. Holmes, Greenwich, N. Y., second prize, $25; Rowley, gray and black, bred by Thomas H. Faile, West Farms, N. Y., calved February 25, 1875, sire Bismarck 1423, dam Edith 3rd, by Jupiter 93, gr. d. Edith, imported by Richard M. Hoe.

BULLS TWO YEARS OLD.

W. L. & W. Rutherford, Waddington, N. Y., first prize, $40; Royal Dane, gray, bred by Moses Ellis, Framingham, Mass., calved June, 1877, sire Sweepstakes Duke 1905, dam Lady Dane by Sam Weller 14, gr. d. Princess 2nd by McClellan 323.

L. W. Ledyard, Cazenovia, N. Y., second prize, $20; Felix Mas, fawn and white, bred by Chas. M. Beach, Hartford, Conn., calved July 24, 1877, sire Lord Francis 1857, dam Daisy Washington by Lord Ogden 69, gr. d. Daisy by General Scott 46.

BULLS ONE YEAR OLD.

Erastus Corning, Albany, N. Y., first prize, $30; Kenwood, solid color, black points, bred by exhibitor, calved March 15, 1878, sire Stockwell 3rd 2770, dam Maid of St. Ouens, imported.

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John D. Wing, Millbrook, N. Y., second prize, $15; Babylon, solid dark, bred by E. R. Durkee, Babylon, N. Y., calved July 25, 1878, sire Jacob 1377, dam Echo 2nd by Devilshoof 866, gr. d. Echo by Lord Nelson 860.

BULL CALVES.

John D. Wing, Millbrook, N. Y., first prize, $10; fawn, bred by exhibitor, calved March 19, 1879, sire Niobe Duke 2364, dam Witch Hazel 3rd by Marius 760, gr. d. Witch Hazel by Southampton 117.

Edwin Thorne, Millbrook, N. Y., second prize, $5; solid light fawn, bred by exhibitor, calved December 19, 1878, sire Niobe Duke 2364, dam Alice Kelsey by Barney 1491, gr. d. Kate K., imported.

COWS OVER THREE YEARS OLD.

John D. Wing, Millbrook, N. Y., first prize, $40; Maple Leaf, fawn, with some white, bred by exhibitor, calved November 10, 1872, sire Ontario 865, dam Echo by Lord Nelson 860, gr. d. Edith 2nd by Saturn 94.

Frank D. Curtis, Charlton, N. Y., second prize, $20; Princess Caroline, mulberry fawn, cream and white, bred by exhibitor, calved July 8, 1871, sire Hero 840, dam Caroline 2nd, imported.

HEIFERS TWO YEARS OLD.

C. R. Agnew, Palisades, N. Y., first prize, $30; Delightsome, solid fawn, bred by exhibitor, calved March 30, 1877, sire Orpheus 1219, dam Mu by Palisades 803, gr. d. Maggie No. 2 by Suffolk 607.

W. L. & W. Rutherford, Waddington, N. Y., second prize, $15; Hinda Parker, dark brown, bred by H. D. Parker, Boston, Mass., calved March 12, 1877, sire Baron Booth 2150, dam Flora Temple, imported by Mr. Parker.

HEIFERS ONE YEAR OLD.

L. W. Ledyard, Cazenovia, N. Y., first prize, $20; Fernwood Gift, yellow fawn and white, bred by George S. Ledyard, Cazenovia, N. Y., calved November 21, 1877, sire Flash 2532, dam Pride of Jersey 3rd by Monitor 878, gr. d. Pride of Jersey by Rob Roy 17.

Horatio B. Curran, Whitestown, N. Y., second prize, $10; Charm, pale fawn, bred by exhibitor, calved March 23, 1878, sire Norwood 1077, dam Hoey 4th, by Ossipee 697, gr. d. Hoey by Saturn 94.

HEIFER CALVES.

C. R. Agnew, Palisades, N. Y., first prize, $10; Delightsome 2nd, bred by exhibitor, calved January 1, 1879, sire Homeric 2798, dam Delightsome by Orpheus 1219, gr. d. Mu by Palisades 803.

John D. Wing, Millbrook, N. Y., second prize, $5; Glimpse 2nd, fawn, bred by exhibitor, calved January 15, 1879, sire Niobe Duke 2364, dam Glimpse by Cossack 1159, gr. d. Josephine Beacon by Touchstone 315.

GUERNSEYS—BULLS TWO YEARS OLD.

L. W. Ledyard, Cazenovia, N. Y., second prize, $20; Neptune, yellow, black and white, sired in Guernsey, calved at sea, April 25, 1877, sire Mr. Mansell's bull Paysan, dam La Fontaine, imported.

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BULLS ONE YEAR OLD.

E. M. S. Nutting, Woodville, N. Y., first prize, $30; Og, yellow and white, bred by Edward Norton, Farmington, Conn , calved April 19, 1878, sire Malbrook 23, dam Princess, imported.

L. W. Ledyard, Cazenovia, N. Y., second prize, $15; Fernwood, yellow fawn and white, sired in Guernsey, calved April 2, 1878, sire Mr. Manger's bull, dam Fernwood Fancy, imported.

COWS OVER THREE YEARS OLD.

L. W. Ledyard, Cazenovia, N. Y., first prize, $40; Fernwood Fancy, yellow, fawn and white, bred by Elizabeth De Garis, St. Saviours, Guernsey, calved December 1875.

HEIFERS ONE YEAR OLD.

E. M. S. Nutting, Woodville, N. Y., first prize, $20; Ceres 2nd, yellow and white, bred by Edward Norton, Farmington, Conn., calved July 4, 1878, sire Mr. Stromger's bull, in Guernsey, dam Ceres, imported.

HEIFER CALVES.

L. W. Ledyard, Cazenovia, N. Y., first prize, $10; Pinafore, yellow fawn and white, bred by exhibitor, calved February, 2, 1879, sire Neptune 41, dam Kathleen, imported.

CATTLE OF ANY KIND — MILCH COWS.

Unadilla Valley Stock Breeders' Association, West Edmeston, N. Y., first prize, $30; Jacoba Hartog, imported Holstein, black and white, bred by Jacob Hartog, in Beemster, North Holland, calved March 1, 1874, last calf April 20, 1879.

Unadilla Valley Stock Breeders' Association, West Edmeston, N. Y., second prize, $15; Maid of Twisk, imported Holstein, black and white, bred by F. Slot in North Holland, calved November, 1870, last calf March 8, 1879.

FAT OXEN OVER FOUR YEARS OLD.

John Merryman, Hayfields, Md., first prize, $30, Hereford, bred by exhibitor, calved December 1, 1874, sire Sir Richard 2nd (4984), dam Bohemian Maid by Admiral (2375).

FAT COWS OVER FOUR YEARS OLD.

John Merryman, Hayfields, Md., first prize, $30; Hereford, Queen of Athens, red, white face, bred by exhibitor, calved June 11, 1873, sire Sir Richard 2nd (4984), dam Jeanie Clark by Admiral (2375).

FAT HEIFERS UNDER FOUR YEARS OLD.

John Merryman, Hayfields, Md., first prize, $30; Princess Victoria 2nd, red, white face, bred by exhibitor, calved January 15, 1877, sire Canadian (4394), dam Princess Victoria by Sir Richard 2nd (4984), gr. d. Giantess by Sir Oliver 2nd (1733).

HORSES.

SPECIAL PRIZE FOR THE BEST DRAUGHT OR AGRICULTURAL STALLION OF ANY AGE OR BREED, $100.

David J. McKnutt, Palmyra, N. Y., special prize, $100; Young Champion, bay, 16.3, six years, sire Malcolm, imported.

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CLYDESDALES AND THEIR CROSSES — STALLIONS OVER FOUR YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $50; Donside Champion, brown, 16.2, eight years, imported, sire Sir Colin, dam Scottish Lass.

David J. McKnutt, Palmyra, N. Y., second prize, $25; Young Champion, bay, 16 3, six years, sire Malcolm, imported.

STALLIONS THREE YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $40; Empire Duke, black, sire Duke of Argyle, dam Lady Thompson by Campsie Jock, gr. d. May by Old Carlisle.

STALLIONS TWO YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $30; Wellington, bay, sire Bold Buccleugh, dam Conqueress by Conqueror, gr. d. Diamond by Duke of Wellington.

STALLIONS ONE YEAR OLD.

Smiths & Powell, Syracuse, N. Y., first price, $20; Climax, chestnut, sire King of the East, dam by Henderson's Clydesdale.

MARES OVER FOUR YEARS OLD.

Smiths & Powell, Syracuse N. Y., first prize, $50; Highland Girl, bay, 16.2, six years, sire Oxford, dam by Robin Hood, gr. d. by an imported Clydesdale horse.

FILLIES TWO YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $30; Lady Clyde, brown, sire Duke of Argyle, dam Lady McDonald by Campsie Jock.

FILLIES ONE YEAR OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $20; Perfection, black, sire King of the East, dam Kate by Campsie Jock, gr. d. by Clark's Clydesdale.

PERCHERONS AND THEIR CROSSES — STALLIONS OVER FOUR YEARS OLD.

Howard G. White, Syracuse, N. Y., first prize, $50; Raspail, gray, 17, four years, bred by P. Sagot, Nogent-le-Rotrou, France, sire Pierrot, dam Couronne.

John H. Starin, Fultonville, N. Y., second prize, $30; Baron Haussman, black, 17, five years, imported by E. A. Buck, New York.

STALLIONS TWO YEARS OLD.

Sanford Thayer, West Schuyler, N. Y., first prize, $30; roan, 15.2, by Babbitt's imported Malo out of a half-bred Percheron mare.

MARES OVER FOUR YEARS OLD.

Howard G. White, Syracuse, N. Y., second prize, $25; Chatton, gray, bred by Goupil Eduz, Nogent-le-Rotrou, France, sire Le Cœur Joli, dam Pauline.

FILLIES THREE YEARS OLD.

Howard G. White, Syracuse, N. Y., first prize, $40; Rustique, gray, bred by H. Guibert, Nogent-le-Rotrou, France, sire Margot, dam Rustique.

H. Langworthy, West Edmeston, N. Y., second prize, $20; Lady Monarch, gray, bred by B. T. Babbitt, New York, sire Monarch, imported by M. W. Dunham, dam by Otsego Chief.

FILLIES TWO YEARS OLD.

Wayne W. Thurstin, Sauquoit, N. Y., first prize, $30; roan, bred by exhibitor, sire B. T. Babbitt's Malo.

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FILLIES ONE YEAR OLD.

Wayne W. Thurstin, Sauquoit, N. Y., first prize, $20; bred by exhibitor, sire B. T. Babbitt's Malo.

H. Langworthy, West Edmeston, N. Y., second prize, $10; Miss Malo, gray, bred by B. T. Babbitt, sire Malo, imported by M. W. Dunham, dam by Otsego Chief.

THOROUGHBREDS AND THEIR CROSSES — SPECIAL PRIZE FOR THE BEST STALLION OF ANY AGE, $150.

Samuel Parson, Oxford Depot, N. Y., the prize, $150; Happy Prince, bay, 15.2, eight years, sire Happy Medium, dam by Vermont Morgan, gr. d. by American Eclipse.

STALLIONS OVER FIVE YEARS OLD

Samuel Parson, Oxford Depot, N. Y., first prize, $70; Happy Prince, bay, 15.2, eight years, sire Happy Medium, dam by Vermont Morgan, gr. d. by American Eclipse.

Smiths & Powell, Syracuse, N. Y., second prize, $35; Reveller, bay, 15.2, nine years, sire Satellite, dam Lizzie by Rydsyk's Hambletonian, gr. d. Gold Button by Exton Eclipse.

STALLIONS FOUR YEARS OLD.

Henry M. Little, Macedon, N. Y., first prize, $60; Tremont, bay, 16.1, bred by A. J. Alexander, Spring Station, Ky., sire Belmont, dam by Alexander's Abdallah.

J. K. Pearson, Cooperstown, N. Y., second prize, $30; Johnny Monroe, black, 15.3, bred by Mr. Monroe, Seneca county, sire Tom Thumb, dam by Beary's Sampson, gr. d. by Dey's Messenger.

STALLIONS THREE YEARS OLD.

Truman Baker, Earlville, N. Y., first prize, $50; Yankee Lightfoot, dark-bay, bred by A. J. Pomeroy, Sidney Centre, N. Y., sire Major Goldsmith, dam by American Star, gr. d. by Kentucky Lightfoot.

Smiths & Powell, Syracuse, N. Y., second prize, $25; Syracuse, bay, sire Reveller, dam Loretta by Stebbins' Hambletonian, gr. d. Floretta by Champion of Crawford County.

STALLIONS TWO YEARS OLD.

George Rathbun, Troy, Pa., first prize, $40; Eclipse, steel gray, bred by exhibitor, sired by Mason's horse, a son of Wood's Hambletonian, dam by Seeley's Black Hawk, gr. d. by Hill's Black Hawk.

J. C. Walters, Leonardsville, N. Y., second prize, $20; Leonardsville Star, brown, bred by exhibitor, sire Kingsley's Roman Chief (son of Walkill Chief), dam by Benedict's Pathfinder, gr. d. by Bellinger's Ethan Allen.

MARES OVER FIVE YEARS OLD.

R. A. Jones, Whitesboro, N. Y., first prize, $60; dark bay, 16, nine years, sire Pathfinder, dam by Black River Messenger.

Lewis Davis, Frankfort, N. Y., second prize, $30; bay, 15.3, ten years, sire Pathfinder, foal at foot by Hambletonian Prince, Jr.

FILLIES FOUR YEARS OLD.

G. H. F. Van Horne, Fonda, N. Y., first prize, $50; Vessey, chestnut, 15.2, foal at foot by J. H. Starin's Commodore.

B. W. Borden, Frankfort, N. Y., second prize, $35; bay, 15.3, sire son of Leach's Starlight.

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FILLIES THREE YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $40; Zephyr, bay, sire Reveller, dam Jessie by old Rough and Ready, gr. d. Tiptoe by Grinnell's Champion.

Henry M. Little, Macedon, N. Y., second prize, $20; Belle of Ashland, dark bay, bred by Treacy & Simmons, Ashland Park., Ky., sire Post's Hambletonian by Rysdyk's Hambletonian, dam by American Clay, gr. d. by Downing's Bay Messenger.

FILLIES TWO YEARS OLD.

A. Chandler, Rome, N. Y., first prize, $30; Lady Kingsley, brown, sire Roman Chief, dam Fanny by Fox Morgan, gr. d. Flora Martin by Powell's bay Messenger.

Smiths & Powell, Syracuse, N. Y., second prize, $15; Mayflower, chestnut, sire Lysander, dam Lady Stark by Consternation, gr. d. by a thorough-bred horse from South Carolina.

FILLIES ONE YEAR OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $20; Finesse, bay, sire Reveller, dam Betty by Tiptoe, gr. d. said to be thorough-bred.

Edward G. Wagner, Whitesboro', N. Y., second prize, $10; dark bay, sire B. T. Babbitt's Highland Chief, he by imported Norman stallion Monarch.

HARNESS AND SADDLE HORSES — DRAUGHT PAIRS.

L. W. Ledyard, Cazenovia, N. Y., first prize, $50; blacks, 15.2, seven and eight years, bred in Canada, partly of Percheron stock.

COACH PAIRS.

Mrs. Milton H. Thompson, Utica, N. Y., first prize, $50; bay geldings, Nip and Tuck, 16, eight years.

John A. Rumsey, Seneca Falls, N. Y., second prize, $25; bay, 16.3, five years.

PHÆTON PAIRS.

George Young, Utica, N. Y., first prize, $50; gray, seven years.

Daniel Jennison, Lock Berlin, N. Y., second prize, $25; brown geldings, five years, sire Patchin, Jr.

COUPE HORSES.

Mark Marriatt, Rome, N. Y., first prize, $30; dark bay, 16, seven years, bred by Jacob Sharp, Rome, N. Y., sire Ned Forrest.

Thomas H. Cackett, New Hartford, N. Y., second prize, $15; Eureka, brown gelding, 16.1, five years, by Walkill Chief.

ROADSTERS.

G. A. Hosington, Adams, N. Y., first prize, $30; brown gelding, five years, sire General Burton.

J. D. Ferguson, Utica, N. Y., second prize, $15; Bay Billy, bay, 16, six years, bred by Roselle Austin, sire Pathfinder.

SADDLE HORSES.

Joseph Juliand, Bainbridge, N. Y., first prize, $30; Flora, spotted, white mane and tail, 15, seven years, sire Don Quixote.

H. C. Gregory, Unadilla, N. Y., second prize, $15; bay mare, 15.1, eight years.

JACKS AND MULES — JACKS.

I. K. Pearson, Cooperstown, N. Y., second prize, $15; Spanish Jack, black, 15 six years.

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SHEEP, SWINE AND POULTRY.

LONG-WOOLED SHEEP — LEICESTER RAMS TWO YEARS OLD OR OVER.

W. L. & W. Rutherford, Waddington, N. Y., second prize, $10; two years, bred by exhibitors.

LEICESTER RAMS ONE YEAR OLD.

W. L. & W. Rutherford, Waddington, N, Y., second prize, $10.

PENS OF (THREE) LEICESTER EWES OVER TWO YEARS OLD.

W. L. & W. Rutherford, Waddington, N. Y., first prize, $20; three years, bred by exhibitors.

PENS OF (THREE) LEICESTER YEARLING EWES.

W. L. & W. Rutherford, Waddington, N. Y., first prize, $20; bred by exhibitors.

COTSWOLD RAMS OVER TWO YEARS OLD.

William Potter, Johnstown, N. Y., first prize, $20.
George Ingersoll, Charleston, N. Y., second prize, $10.

COTSWOLD RAMS ONE YEAR OLD.

George Ingersoll, Charleston, N. Y., first prize, $20.
George Ingersoll, Charleston, N. Y., second prize, $10.

PENS OF (THREE) COTSWOLD EWES OVER TWO YEARS OLD.

George Ingersoll, Charleston, N. Y., first prize, $20.
George Ingersoll, Charleston, N. Y., second prize, $10.

PENS OF (THREE) COTSWOLD YEARLING EWES.

George Ingersoll, Charleston, N. Y., first prize, $20.
George Ingersoll, Charleston, N. Y., second prize, $10.

LINCOLN RAMS OVER TWO YEARS OLD.

Samuel Campbell, New York Mills, N. Y., first prize, $20; two years.

LINCOLN RAMS ONE YEAR OLD.

Johnson & Smith, Geneva, N. Y., first prize, $20.

PENS OF (THREE) LINCOLN EWES OVER TWO YEARS OLD.

Johnson & Smith, Geneva, N. Y., first prize, $20.
Samuel Campbell, New York Mills, N. Y., second prize, $10.

PENS OF (THREE) LINCOLN YEARLING EWES.

Johnson & Smith, Geneva, N. Y., first prize, $20.
Samuel Campbell, New York Mills, N. Y., second prize, $10.

MIDDLE-WOOLED SHEEP — SOUTHDOWN RAMS OVER TWO YEARS OLD.

John D. Wing, Millbrook, N. Y., first prize, $20; bred by Lord Walsingham.
John D. Wing, Millbrook, N. Y., second prize, $10; bred by exhibitor.

SOUTHDOWN RAMS ONE YEAR OLD.

Daniel B. Haight, Dover Plains, N. Y., first prize, $20; bred by Lord Walsingham.
John D. Wing, Millbrook, N. Y., second prize, $10; bred by exhibitor.

PENS OF (THREE) SOUTHDOWN EWES OVER TWO YEARS OLD.

John D. Wing, Millbrook, N. Y., first prize, $20; bred by exhibitor.
John D. Wing, Millbrook, N. Y., second prize, $10; bred by exhibitor.

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PENS OF (THREE) SOUTHDOWN YEARLING EWES.

Daniel B. Haight, Dover Plains, N. Y., first prize, $20; bred by exhibitor.
John D. Wing, Millbrook, N. Y., second prize, $10; bred by exhibitor.

SHROPSHIRE RAMS OVER TWO YEARS OLD.

Mrs. L. C. Fish, Otego N. Y., first prize, $20.
Berosus Cook, Otego, N. Y., second prize, $10.

SHROPSHIRE RAMS ONE YEAR OLD.

Berosus Cook, Otego, N. Y., first prize, $20.
Mrs. L. C. Fish, Otego, N. Y., second prize, $10.

PENS OF (THREE) SHROPSHIRE EWES OVER TWO YEARS OLD.

Mrs. L. C. Fish, Otego, N. Y., first prize, $20.
E. B. Hawks, Wells' Bridge, N. Y., second prize, $10.

PENS OF (THREE) SHROPSHIRE YEARLING EWES.

Berosus Cook, Otego, N. Y., first prize, $20.
Mrs L. C. Fish, Otego, N. Y., second prize, $10.

HAMPSHIRE RAMS OVER TWO YEARS OLD.

Eugene Ham, Verbank, N. Y., first prize, $20; four years, bred by L. Kline, North Egremont, Mass.
Henry Metcalf, Canandaigua, N. Y., second prize, $10.

HAMPSHIRE RAMS ONE YEAR OLD.

Henry Metcalf, Canandaigua, N. Y., first prize, $20.

PENS OF (THREE) HAMPSHIRE EWES OVER TWO YEARS OLD.

Henry Metcalf, Canandaigua, N. Y., first prize, $20.
Eugene Ham, Verbank, N. Y., second prize, $10.

PENS OF (THREE) HAMPSHIRE YEARLING EWES.

Henry Metcalf, Canandaigua, N. Y., first prize, $20.

FINE-WOOLED SHEEP — MERINOS BRED FOR FINENESS OF WOOL — RAMS OVER TWO YEARS OLD.

Carl Heyne, Red Hook, N. Y., first prize, $20.
Carl Heyne, Red Hook, N. Y., second prize, $10.

RAMS ONE YEAR OLD.

Carl Heyne, Red Hook, N. Y., first prize, $20.
Carl Heyne, Red Hook, N. Y., second prize, $10.

PENS OF (THREE) EWES OVER THREE YEARS OLD.

Carl Heyne, Red Hook, N. Y., first prize, $20.
Carl Heyne, Red Hook, N. Y., second prize, $10.

PENS OF (THREE) EWES TWO YEARS OLD OR UNDER.

Carl Heyne, Red Hook, N. Y., first prize, $20.
J. W. Hardy, Palmyra, N. Y., second prize, $10.

MERINOS BRED FOR WEIGHT OF FLEECE — RAMS OVER TWO YEARS OLD.

S. B. Lusk, Batavia, N. Y., first prize, $20; New York, bred by exhibitor.

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RAMS ONE YEAR OLD.

S. B. Lusk, Batavia, N. Y., first prize, $20; bred by exhibitor.
J. W. Hardy, Palmyra, N. Y., second prize, $10.

PENS OF (THREE) EWES TWO YEARS OLD OR UNDER.

S. B. Lusk, Batavia, N. Y., first prize, $20; bred by exhibitor.
J. W. Hardy, Palmyra, N. Y., second prize, $10.

MERINOS BRED FOR LENGTH OF STAPLE — RAMS ONE YEAR OLD.

J. W. Hardy, Palmyra, N. Y., first prize, $20.
S. B. Lusk, Batavia, N. Y., second prize, $10; bred by exhibitor.

PENS OF (THREE) EWES OVER THREE YEARS OLD.

S. B. Lusk, Batavia, N. Y., first prize, $20; bred by exhibitor.

PENS OF (THREE) EWES TWO YEARS OLD OR UNDER.

J. W. Hardy, Palmyra, N. Y., first prize. $20.
S. B. Lusk, Batavia, N. Y., second prize, $10; two years, bred by exhibitor.

SWINE — LARGE WHITE BREED — BOARS OVER ONE YEAR OLD.

Frank D. Curtis, Charlton, N. Y., first prize, $20: Victoria.
Charles Spice, Utica, N. Y., second prize, $10.

BOARS UNDER ONE YEAR OLD.

Charles Spice, Utica, N. Y., first prize, $20.
E. W. Davis, Oneida Castle, N. Y., second prize, $10.

SOWS OVER ONE YEAR OLD.

Charles Spice, Utica, N. Y., first prize, $20.
E. W. Davis, Oneida Castle, N. Y., second prize, $10; Eve, two years six months.

SOWS UNDER ONE YEAR OLD.

E. W. Davis, Oneida Castle, N. Y., first prize, $20.
Charles Spice, Utica, N. Y., second prize, $10.

POLAND CHINA — BOARS OVER ONE YEAR OLD.

G. H. Bell, Rome, N.Y., first prize, $20; Tramp, one year and five months, bred by B. F. Tracy, Owego, N. Y.
L. C. Gardner, Fayetteville, N. Y., second prize, $10; bred by exhibitor.

BOARS UNDER ONE YEAR OLD.

G. H. Bell, Rome, N. Y., first prize, $20; Marshland Boy, bred by B. F. Tracy, Owego, N. Y.
B. F. Tracy, Owego, N. Y., second prize, $10; bred by exhibitor.

SOWS OVER ONE YEAR OLD.

G. H. Bell, Rome, N.Y., first prize, $20; Violet, bred by B. F. Tracy, Owego, N. Y.
B. F. Tracy, Owego, N. Y., second prize, $10; Grace, bred by D. M. Magie & Co.

SOWS UNDER ONE YEAR OLD.

B. F. Tracy, Owego, N. Y., first prize, $20; bred by exhibitor.
B. F. Tracy, Owego, N. Y., second prize, $10; bred by exhibitor.

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DUROC OR RED—BOARS OVER ONE YEAR OLD.

H. & C. H. Holmes, Greenwich, N. Y., first prize, $20; Major, sire Capt. Jack, dam 20.

Oscar J. Lewis, Schodack Centre, N. Y., second prize, $10.

BOARS UNDER ONE YEAR OLD.

H. & C. H. Holmes, Greenwich, N. Y., first prize, $20; Red Jacket, sire Major 13, dam Queen.

SOWS OVER ONE YEAR OLD.

H. & C. H. Holmes, Greenwich, N. Y., first prize, $20; Ruby, sire 13, dam 30.

Frank D. Curtis, Charlton, N. Y., second prize, $10.

SOWS UNDER ONE YEAR OLD.

H. & C. H. Holmes, Greenwich, N. Y., first prize, $20; Garnet, sire Logan 15, dam Marshall.

H. & C. H. Holmes, Greenwich, N. Y., second prize, $10; Ninette, sire Logan 15, dam Nina.

SMALL WHITE BREED—BOARS OVER ONE YEAR OLD.

H. H. Ingersoll, Owego, N. Y., first prize, $20; Crown Prince, bred by exhibitor.

T. R. Proctor, Utica, N. Y., second prize, $10; King George (Yorkshire), bred by Arthur L. Dale, Westernville, N. Y., sire imported Duke of Yorkshire.

BOARS UNDER ONE YEAR OLD.

T. R. Proctor, Utica, N. Y., first prize, $20; Rinaldo (Yorkshire), bred by R. M. Hoe, New York, sire Romeo.

J. S. Woodward, Lockport, N. Y., second prize, $10 (white Suffolk).

SOWS OVER ONE YEAR OLD.

H. H. Ingersoll, Owego, N. Y., first prize, $20; Ada Bell, bred by exhibitor.

T. R. Proctor, Utica, N. Y., second prize, $15; Yorkshire Lass (Yorkshire), bred by Arthur L. Dale, Westernville, N. Y., sire imported Forest Boy.

SOWS UNDER ONE YEAR OLD.

J. S. Woodward, Lockport, N. Y., first prize, $20 (white Suffolk).

H. H. Ingersoll, Owego, N. Y., second prize, $10; Queen 2nd, bred by exhibitor.

BERKSHIRES—BOARS OVER ONE YEAR OLD.

Alexander M. Fulford, Bel Air, Md., first prize, $20; bred by W. C. Norton.

H. Bowen, Medina, N. Y., second prize, $10; Sambo IX, Jr., bred by Wm. Smith, Michigan, sire Sambo IX, imported, dam Susie, gr. d. Maid of Oxford.

BOARS UNDER ONE YEAR OLD.

Alexander M. Fulford, Bel Air, Md., first prize, $20.

Alexander M. Fulford, Bel Air, Md., second prize, $10.

Amos N. Potter, Ridge Mills, N. Y., highly commended; Benjamin, bred by B. N. Newhouse, Utica.

SOWS OVER ONE YEAR OLD.

Alexander M. Fulford, Bel Air, Md., first prize, $20.

T. R. Proctor, Utica, N. Y., second prize, $10; Gipsy Queen 3rd, bred by exhibitor, sire Gloucester.

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SOWS UNDER ONE YEAR OLD.

Alexander M. Fulford, Bel Air, Md., first prize, $20.
T. R. Proctor, Utica, N. Y., second prize, $10; Gipsy Queen 4th, bred by exhibitor, sire Gloucester.

ESSEX — BOARS OVER ONE YEAR OLD.

Joseph Harris, Rochester, N. Y., first prize, $20.
J. S. Woodward, Lockport, N. Y., second prize, $10.

BOARS UNDER ONE YEAR OLD.

Joseph Harris, Rochester, N. Y., first prize, $20.
J. S. Woodward, Lockport, N. Y., second prize, $10.

SOWS OVER ONE YEAR OLD.

J. S. Woodward, Lockport, N. Y., first prize, $20.
Joseph Harris, Rochester, N. Y., second prize, $10.

SOWS UNDER ONE YEAR OLD.

J. S. Woodward, Lockport, N. Y., first prize, $20.
J. S. Woodward, Lockport, N. Y., second prize, $10.

POULTRY — COLLECTIONS OF PURE-BRED POULTRY.

O. Howland, Auburn, N. Y., large silver medal.

PAIRS OF LIGHT BRAHMAS.

H. B. Thomas, Troy, N. Y., first prize, $5.
T. R. Proctor, Utica, N. Y., second prize, $3.

PAIRS OF DARK BRAHMAS.

J. M. Seymour, Clark's Mills, N. Y., first prize, $5.

PAIRS OF BUFF, LEMON, OR CINNAMON COCHINS.

L. J. Bundy, Furnaceville, N. Y., first prize, $5.
J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

PAIRS OF PARTRIDGE, OR GROUSE COCHINS.

J. M. Seymour, Clark's Mills, N. Y., first prize, $5.
O. Howland, Auburn, N. Y., second prize, $3.

PAIRS OF WHITE COCHINS.

J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

PAIRS OF COLOURED DORKINGS.

G. H. Warner, New York Mills, N. Y., first prize, $5.
J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

PAIRS OF SILVER GRAY DORKINGS.

G. H. Warner, New York Mills, N. Y., first prize, $5.
J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

PAIRS OF WHITE DORKINGS.

G. H. Warner, New York Mills, N. Y., first prize, $5.

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PAIRS OF DOMINIQUES.

S. P. Halleck, Oriskany, N. Y., first prize, $5.
S. P. Halleck, Oriskany, N. Y., second prize, $3.

PAIRS OF GOLDEN SPANGLED HAMBURGHS.

Newton Adams, Utica, N. Y., first prize, $5.
Newton Adams, Utica, N. Y., second prize, $3.

PAIRS OF SILVER SPANGLED HAMBURGHS.

Newton Adams, Utica, N. Y., first prize, $5.
Edwin E. Kelty, Albany, N. Y., second prize, $3.

PAIRS OF GOLDEN PENCILED HAMBURGHS.

W. H. Underwood, East Scott, N. Y., first prize, $5.

PAIRS OF SILVER PENCILED HAMBURGHS.

Newton Adams, Utica, N. Y., first prize, $5.
D. A. Carter, Utica, N. Y., second prize, $3.

PAIRS OF BLACK HAMBURGHS.

W. H. Underwood, East Scott, N. Y., first prize, $5.
Newton Adams, Utica, N. Y., second prize, $3.

PAIRS OF WHITE HAMBURGHS

Edwin E. Kelty, Albany, N. Y., first prize, $5.

PAIRS OF BLACK SPANISH.

O. Howland, Auburn, N. Y., first prize, $5.
W. H. Underwood, East Scott, N. Y., second prize, $3.

PAIRS OF WHITE LEGHORNS.

O. Howland, Auburn, N. Y., first prize, $5.
W. H. Underwood, East Scott, N. Y., second prize, $3

PAIRS OF BROWN LEGHORNS.

H. B. Thomas, Troy, N. Y., first prize, $5.
John D. Ernst, Franklin Iron Works, N. Y., second prize, $3.

PAIRS OF BLACK LEGHORNS.

J. M. & H. Semple, Utica, N. Y., first prize, $5.
J. M. & H. Semple, Utica, N. Y., second prize, $3.

PAIRS OF DOMINIQUE LEGHORNS.

W. H. Underwood, East Scott, N. Y., first prize, $5.

PAIRS OF PLYMOUTH ROCKS.

L. J. Bundy, Furnaceville, N. Y., first prize, $5.
L. J. Bundy, Furnaceville, N. Y., second prize, $3.

PAIRS OF CREVE-COEURS.

J. M Seymour, Clark's Mills, N. Y., first prize, $5.
J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

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PAIRS OF HOUDANS.

Michael Ryan, Utica, N. Y., first prize, $5.
Michael Ryan, Utica, N. Y., second prize, $3.

PAIRS OF LA FLECHE.

J. M. Seymour, Clark's Mills, N. Y., first prize, $5.
O. Howland, Auburn, N. Y., second prize, $3.

PAIRS OF BLACK POLISH.

W. H. Underwood, East Scott, N. Y., first prize, $5.
W. H. Underwood, East Scott, N. Y., second prize, $3.

PAIRS OF WHITE POLISH (WHITE CRESTS).

W. H. Underwood, East Scott, N. Y., first prize, $5.
W. H. Underwood, East Scott, N. Y., second prize, $3.

PAIRS OF GOLDEN POLISH.

O. Howland, Auburn, N. Y., second prize, $3.

PAIRS OF SILVER POLISH.

O. Howland, Auburn, N. Y., first prize, $5.
W. H. Underwood, East Scott, N. Y., second prize, $3.

PAIRS OF BLACK-BREASTED RED GAMES.

J. M. Seymour, Clark's Mills, N. Y., first prize, $5.
John Hope, Millbrook, N. Y., second prize, $3.

PAIRS OF BROWN-BREASTED RED GAMES.

John Hope, Millbrook, N. Y., first prize, $5.
John Hope, Millbrook, N. Y., second prize, $3.

PAIRS OF SILVER DUCK-WING GAMES.

H. W. Skerritt,, Deansville, N. Y., second prize, $3.

PAIRS OF YELLOW DUCK-WING GAMES.

A. B. Smith, Whitesboro, N. Y., first prize, $5.
J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

PAIRS OF RED PILE GAMES

O. Howland, Auburn, N. Y., first prize, $5
John Hope, Millbrook, N. Y., second prize, $3.

PAIRS OF WHITE PILE GAMES.

W. H. Underwood. East Scott, N. Y., first prize, $5.
J. M. Seymour, Clark's Mills, N. Y., second prize, $3

PAIRS OF BLACK RED GAME BANTAMS.

W. V. Keith, Deansville, N. Y., first prize, $5.
O. Howland, Auburn, N. Y., second prize, $3.

PAIRS OF RED PILE GAME BANTAMS.

O. Howland, Auburn, N. Y., first prize, $5.
D. A. Carter, Utica, N. Y., second prize, $3.

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PAIRS OF SILVER DUCK-WING GAME BANTAMS.

H. W. Skerritt, Deansville, N. Y., first prize, $5.
H. W. Skerritt, Deansville, N. Y., second prize, $3.

PAIRS OF YELLOW DUCK-WING GAME BANTAMS.

O. Howland, Auburn, N. Y., first prize, $5.
J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

PAIRS OF GOLD-LACED SEBRIGHT BANTAMS.

G. H. Warner, New York Mills, N. Y., first prize, $5.
J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

PAIRS OF BLACK BANTAMS.

J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

PAIRS OF OTHER BANTAMS.

O. Howland, Auburn, N. Y., second prize, $3 (white booted).

PAIRS OF BRONZE TURKEYS.

Joseph Juliand, Bainbridge, N. Y., first prize, $5.

PAIRS OF WHITE TURKEYS.

Frank D. Curtis, Charlton, N. Y., first prize, $5.
D. A. Carter, Utica, N. Y., second prize, $3.

PAIRS OF GRAY OR NARRAGANSET TURKEYS.

J M. Seymour, Clark's Mills, N. Y., first prize, $5.

PAIRS OF PEARL GUINEA FOWLS.

Orsino Beebe, Hamilton, N. Y., first prize, $5.
R. A. Jones, Whitesboro, N. Y., second prize, $3.

PAIRS OF WHITE GUINEA FOWLS.

Joseph Juliand, Bainbridge, N. Y., first prize, $5.
W. H. Underwood, East Scott, N. Y., second prize, $3.

PAIRS OF PEA FOWLS.

Joseph Juliand, Bainbridge, N. Y., first prize, $5.
T. W. Spaford, Clinton, N. Y., second prize, $3.

PAIRS OF BREMEN GEESE.

O. Howland, Auburn, N. Y., first prize, $5.
N. Barns, New Hartford, N. Y., second prize, $3.

PAIRS OF WHITE CHINA GEESE.

O. Howland, Auburn, N. Y., first prize, $5.

PAIRS OF BROWN CHINA GEESE.

O. Howland, Auburn, N. Y., first prize, $5.
Joseph Juliand, Bainbridge, N. Y., second prize, $3.

PAIRS OF WILD GEESE.

O. Howland, Auburn, N. Y., second prize, $3.

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PAIRS OF ROUEN DUCKS.

W. H. Underwood, East Scott, N. Y., first prize, $5.
J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

PAIRS OF AYLESBURY DUCKS.

O. Howland, Auburn, N. Y., first prize, $5.
W. H. Underwood, East Scott, N. Y., second prize, $3.

PAIRS OF CAYUGA DUCKS.

J. M. Seymour, Clark's Mills, N. Y., first prize, $5.
O. Howland, Auburn, N. Y., second prize, $3.

PAIRS OF MUSCOVY DUCKS.

R. A. Jones, Whitesboro, N. Y., first prize, $5.
F. S. Blessing, Slingerlands, N. Y., second prize, $3.

PAIRS OF PEKIN DUCKS.

O. Howland, Auburn, N. Y., first prize, $5.
N. Barns, New Hartford, N. Y., second prize, $3.

PIGEONS—PAIRS OF POUTERS.

Mathias Cook, Utica, N. Y., first prize, $3.
Fred. S. Blessing, Slingerlands, N. Y., second prize, $2.

PAIRS OF SHORT-FACED TUMBLERS.

Mathias Cook, Utica, N. Y., first prize, $3.

PAIRS OF BARBS.

Mathias Cook, Utica, N. Y., first prize, $3.

PAIRS OF TURBITS (WINGED).

Mathias Cook, Utica, N. Y., second prize, $2.

PAIRS OF OWLS (SOLID COLOR).

Mathias Cook, Utica, N. Y., first prize, $3.

PAIRS OF SHAKING FANTAILS.

Mathias Cook, Utica, N. Y., first prize, $3.
N. Barns, New Hartford, N. Y., second prize, $2.

PAIRS OF JACOBINS.

N. Barns, New Hartford, N. Y., first prize, $3.

PAIRS OF BLUE ROCKS.

Mathias, Cook, Utica, N. Y., first prize, $3.

PAIRS OF DRAGOONS.

Mathias Cook, Utica, N. Y., first prize, $3.

PAIRS OF ANTWERPS.

Mathias Cook, Utica, N. Y., first prize, $3.

COLLECTIONS OF POUTERS.

Mathias Cook, Utica, N. Y., first prize, $5.

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COLLECTIONS OF TUMBLERS.

Mathias Cook, Utica, N. Y., first prize, $5.

COLLECTIONS OF FANCY PIGEONS.

Mathias Cook, Utica, N. Y., first prize, $5.

COLLECTIONS OF TOY PIGEONS.

Mathias Cook, Utica, N. Y., first prize, $5.

LOP-EARED OR MADAGASCAR RABBITS — SELF-COLOURED BUCKS.

George H. Warner, New York Mills, N. Y., first prize, $3.

BROKEN-COLOURED DOES.

George H. Warner, New York Mills, N. Y., second prize, $2.

COMMON RABBITS — BUCKS.

F. S. Blessing, Slingerlands, N. Y., second prize, $1.

DOES.

Joseph Juliand, Bainbridge, N. Y., first prize, $2.

EXTRA ENTRIES.

Stephen Treen, Utica, N. Y., $2; Himmalayan rabbits.
Stephen Treen, Utica, N. Y., $1; Angora rabbits.

HATCHING APPARATUS.

INCUBATORS (IN OPERATION).

A. M. Halsted, Rye, N. Y., first prize, $10; Centennial incubator, No. 1, $50.

ARTIFICIAL MOTHERS.

A. M. Halsted, Rye, N. Y., first prize, $10; Centennial brooder, No. 1 size, $15.
A. M. Halsted, Rye, N. Y., second prize, $5; Centennial brooder (new style, all metal, $6).

IMPLEMENTS AND MACHINERY.

PORTABLE STEAM ENGINES, ETC.

Philo S. Curtis, Utica, N. Y., bronze medal; portable steam engine and boiler, ten-horse power.
Philo S. Curtis, Utica, N. Y., bronze medal; portable dairy engine and boiler, five-horse power.
Empire Steam Pump Co., Carthage, N. Y., certificate of merit; sectional steam boiler, 800 pounds, $115.
Empire Steam Pump Co., Carthage, N. Y., certificate of high merit; steam pumping engine, 75 pounds, $40.
G. Westinghouse & Co., Schenectady, N. Y., bronze medal; portable steam engine, ten-horse power, 3,800 pounds, $900.

POTATO DIGGERS.

William Boyd, Hartford, N. Y., certificate of merit; 950 pounds, $125.
George W. Kintz, West Henrietta, N. Y., certificate of merit; 175 pounds, $25.
J. S. Hotaling, Albany, N. Y., certificate of high merit.

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PLOUGHS AND ATTACHMENTS TO PLOUGHS.

Gale Manufacturing Co., Albion, Mich., certificate of high merit; exhibition of chilled ploughs.

Syracuse Chilled Plow Co., Syracuse, N. Y., certificate of high merit; exhibition of chilled iron ploughs.

POTATO BEETLE DESTROYERS.

John C. Campbell, Syracuse, N. Y., certificate of merit; potato bug destroyer, worked by horse power.

Potter & Dewey, Boonville, N. Y., certificate of merit; Potter's potato bug destroyer, 98 pounds, $15.

Goodrich E. Risley, Waterville, N. Y., certificate of merit; machine for gathering potato bugs, 80 pounds, $50.

MISCELLANEOUS.

H. Brewer & Co., Tecumseh, Mich., certificate of high merit; machine for manufacturing drain tile and brick, 4,000 pounds, tile machine, $540; attachments for brick, $85.

Chadbourne & Coldwell Manufacturing Co., Newburgh, N. Y., certificate of merit; lawn mowers.

The Earle Clothes Dryer Manufacturing Co., Utica, N. Y., certificate of high merit; dryer and lawn tent combined.

J. M. Gray, Hamilton, N. Y., certificate of merit; snow ploughs.

John Hafer, Bedford, Pa., certificate of high merit; Hafer's self-bracing portable fence.

Pierce Well Excavator Co., New York city, certificate of high merit; well excavator or earth auger, 1,200 pounds, $150.

Pierce Well Excavator Co., New York city, certificate of high merit; artesian well drilling and mineral prospecting machine, 3,000 pounds, $654.

J. C. Read, New Hartford, N. Y., certificate of high merit; improved farm gate, 64 pounds, $5.

A. J. Whitcomb & Jas. H. Fitch, Ilion, N. Y., certificate of high merit; lawn mower called the "Ladies' Friend," hand power 14-inch machine, 23 pounds, $14.

Utica Novelty Works, Utica, N. Y., certificate of high merit; combined pipe-wrench and ratchet drill.

HAY AND CATTLE SCALES.

Jones of Binghamton, Binghamton, N. Y., bronze medal; five ton hay scale.

FANNING MILLS.

S. B. Van Duzer & Co., Gouverneur, N. Y., bronze medal; Bonanza fanning mill for cleaning grain from the chaff, 100 pounds, $40.

MACHINES FOR CLEANING AND ASSORTING GRAIN, ETC.

S. B. Van Duzer & Co., Gouverneur, N. Y., bronze medal; Bonanza machine for cleaning and assorting grain and seeds, 190 pounds, $40.

CORN HUSKING MACHINES.

J. Van Zandt, Schenectady, N. Y., bronze medal; Jones' patent corn-husker, steam or horse-power, 800 pounds, $125

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FLAX-SEED CLEANERS.

S. B. Van Duzer & Co., Gouverneur, N. Y., bronze medal; Bonanza machine for cleaning flax-seed, 190 pounds, $40.

BUCKWHEAT SCOURERS.

Munson Brothers, Utica, N. Y., certificate of high merit; buckwheat huller.

FEED OR CHAFF CUTTERS FOR POWER.

E. W. Ross & Co., Fulton, N. Y., bronze medal; feed cutter for power, $70.

Keystone Manufacturing Co., Sterling Ill, certificate of high merit; hand and power feed cutter, 275 pounds, $35.

HAND AND FEED CUTTERS.

E. W. Ross & Co., Fulton, N. Y., bronze medal; feed cutter for hand, $30.

CORN SHELLERS — POWER.

Keystone Manufacturing Co., Sterling, Ill., bronze medal, two-horse power, 200 pounds, $22.

CORN SHELLERS — HAND.

Keystone Manufacturing Co., Sterling, Ill., bronze medal, 100 pounds, $12.50.

FARM GRAIN MILLS.

Ames Plow Co., Boston, Mass., bronze medal; improved horse or hand grain mill, $20.

Ames Plow Co., Boston, Mass., bronze medal; No. 5 improved hand corn mill, $7.50.

Munson Brothers, Utica, N. Y., bronze medal; No 24 mill for feed and corn, with and without bolting attachment for making buckwheat flour.

APPLE GRINDERS OR GRATERS — POWER.

Boomer & Boschert Press Co., Syracuse, N. Y., bronze medal; apple-grater, 290 pounds.

CIDER MILLS.

Ames Plow Co., Boston, Mass., bronze medal; National family cider and wine mill, $15; ditto Farmers' ditto, $30.

Keystone Manufacturing Co., Sterling, Ill., bronze medal; large (hand) cider mill, 400 pounds, $33.

HAND AND POWER PRESSES.

Boomer & Boschert Press Co., Syracuse, N. Y., bronze medal; power cider press, 2,500 pounds.

P. K. Dederick, & Co., Albany, N. Y., bronze medal; lever perpetual hay-press, $350.

ROOT CUTTERS.

Ames Plow Co., Boston, Mass., bronze medal; vegetable cutter, N. M. & Co., $15.

PUMPS FOR FARM USE.

A. W. Miner & Co., Belmont, N. Y., bronze medal; Howe's triple action force pumps, 100 pounds, $15.

Joseph Nunn, Carthage, N. Y., bronze medal; rubber bucket chain pump.

Rumsey & Co., Seneca Falls. N. Y., bronze medal; pumps, hydraulic rams, garden and green-house engines, etc.

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WASHING MACHINES.

David J. H. Davies, Ogdensburgh, N. Y., certificate of high merit; the Howell steam washer and bleacher, 18 pounds, $8 and $16.

D. W. Fox, North Harpersfield, N. Y., certificate of high merit; Common Sense clothes washer, 10 pounds, $6.50.

MISCELLANEOUS.

D. D. Brewster & Son, Unadilla, N. Y., bronze medal; buckwheat refiner, 900 pounds, $300.

L. Dean, Utica, N. Y., certificate of high merit; exhibition of wrought-iron fence, settees, vases, etc.

Washburn & Moen Manufacturing Co., Worcester, Mass., certificate of high merit; machinery for making barbed fence wire.

WOOD-WORKING MACHINERY — HAND SCROLL-SAWING MACHINES.

Miller's Falls Co., New York, bronze medal; Lester scroll-saw and lathe, 50 pounds, $8.

Miller's Falls Co., New York, bronze medal; Rogers' scroll-saw, 30 pounds, $8.

DAIRY IMPLEMENTS — CHURNS FOR LARGE DAIRIES.

Ezra Buell, Heuvelton, N. Y., bronze medal; $25.

CHURNS FOR SMALL DAIRIES.

Ames Plow Co., Boston, Mass., bronze medal; No. 4 Davis' self-adjusting churn and butter worker, $6; No. 6, $9.

Vermont Farm Machine Co., Bellows Falls, Vt., certificate of merit; Davis' oscillating churn.

BUTTER WORKERS.

Vermont Farm Machine Co., Bellows Falls, Vt., certificate of merit; Eureka butter worker.

MILK PANS — METAL.

Bunnell & Brown, Guilford, N. Y., bronze medal; iron-clad milk pans.

BUTTER TUBS.

Richard R. Jones, Remsen, N. Y., bronze medal 50 pounds size, 12 pounds, 60 cts.; 35 pounds size, 10 pounds, 50 cts.

PACKAGES FOR TRANSPORTING BUTTER IN HOT WEATHER.

Dairy Supply Co., New York, N. Y., bronze medal; transportation tubs and boxes, with or without ice.

COOPERS' WORK.

Richard R. Jones, Remsen, N. Y., bronze medal.

MISCELLANEOUS DAIRY APPLIANCES.

Samuel Bligh, Oneonta, N. Y., certificate of merit; self-motor power churning machine, 1,000 pounds, $50.

Bunnell & Brown, Guilford, N. Y., certificate of merit; Brown's Arctic creamery.

Bunnell & Brown, Guilford, N. Y., certificate of high merit; butter salting scales.

Dairy Supply Co., New York, N. Y., certificate of high merit; glass milk jars and bottles, for individual delivery.

A. A. Durand, Auburn, N. Y., certificate of merit; Durand's suction cow milker, $55.

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The Ferguson Manufacturing Co., Burlington, Vt., certificate of high merit; the Ferguson bureau creamery, 400 pounds, $50 to $63.

Horton Brothers, Binghamton, N. Y., certificate of merit; Horton's new creamery, 125 pounds, $25.

Hull & Arnold, Maine, N. Y., certificate of merit; Dairyman's Friend creamery, 60 pounds, $20.

Moseley & Stoddard, Poultney, Vt., certificate of high merit; Moseley's Cabinet creamery, No. 2, for raising cream in farm dairy, also in hotels, etc., 145 pounds, $30.

Dairy Supply Co., New York, N. Y., certificate of merit; perfect milk pail.

TOOLS AND HAND IMPLEMENTS.

EXHIBITIONS OF FARM AND GARDEN TOOLS AND IMPLEMENTS.

J. M. Childs & Co., Utica, N. Y., bronze medal.

J. M. Childs & Co., Utica, N. Y., certificate of high merit; display of ploughs.

EXHIBITIONS OF CARPENTERS' AND MECHANICS' TOOLS.

William Dent & Son, Utica, N. Y., bronze medal; exhibition of machinists' tools, consisting of drills, screw plates, taps and dies, drill chucks, Stephen's patent vices, etc.

Herman Ehle, Utica, N. Y., certificate of merit; combined sleigh and wheel-barrow.

Miller's Falls Co., New York, N. Y., certificate of merit; family grind-stone and emery wheel, $3.50.

Miller's Falls Co., New York, N. Y., certificate of high merit; Langdon's mitre box, $10.

J. V. Henry Nott, Glenerie, N. Y., certificate of merit; bag holder and hand truck, 30 pounds, $4.

B. T. Steber, Utica, N. Y., bronze medal; Steber's patent ratchet drill, telescopic sections having motion upon each other, giving capacity for different situations and variable length; with extension handle, No. 1, three inches, $14.50; No. 2, four inches, $17.50; No. 3, five inches, $20; with ordinary handle, $13, $15 and $18.

WAGGONS, CARRIAGES, SADDLERY AND ARTICLES OF WHEELWRIGHTS' AND BLACKSMITHS' WORK.

PARK PHÆTONS — FOUR OR SIX SEATS.

F. Coleman & Co., Ilion, N. Y., bronze medal; six seat pleasure waggon, 650 pounds, $200.

ROAD WAGGONS — FOUR SEATS.

C. Benedict, Little Falls, N. Y., bronze medal; two seat Windsor T cart, 400 pounds, $225.

Watertown Spring Waggon Co., Watertown, N. Y., first premium; platform pleasure waggon, four seats, 400 pounds, $115.

Watertown Spring Waggon Co, Watertown, N. Y., bronze medal; platform spring road waggon, with Fitch & Wood patent reach and drawing from the axle, four seats, 450 pounds, $100.

OPEN WAGGONS — TWO SEATS.

F. Coleman & Co., Ilion, N. Y., bronze medal; Brewster patent side-bar waggon, 275 pounds, $160.

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Jacob C. Walter, Leonardsville, N. Y., certificate of merit; coil spring, for side-bar waggons.

TOP WAGGONS—TWO SEATS.

C. Benedict, Little Falls, N. Y., bronze medal: side-bar top buggy, 225 pounds, $225.

F. Coleman & Co., Ilion, N. Y., bronze medal; single phæton, three springs, with top, 300 pounds, $275.

BUSINESS WAGGONS.

Watertown Spring Wagon Co., Watertown, N. Y., bronze medal; platform spring business waggon, 400 pounds, $90.

DOUBLE FARM WAGGONS.

Empire State Wagon Works, Lyons, N. Y., bronze medal; full rigged lumber waggon for farm use, 800 pounds, $65.

Aristide T. Hermant, Utica, N. Y., certificate of high merit.

ROLLERS.

Stringer, Barr & Co., Munnsville, N. Y., bronze medal; land roller, 1,350 pounds, $45.

EXTRA ENTRIES.

John C. Campbell, Syracuse, N. Y., certificate of merit; improved draft bars for sleighs.

O. S. Gorton, North Brookfield, N. Y., certificate of merit; patent spring waggon gear, 178 lbs., $32.

John N. Meyer, Hamilton, N. Y., certificate of hight merit; patent hubs for waggon wheels.

F. C. Mitchell & Co., Benton Harbor, Mich., certificate of high merit; patent helical spring for beds, waggon seats, etc.; bed, 25 pounds, $6; seat, 30 pounds, $5.

H. W. Pell, Rome, N. Y., certificate of high merit; side-bar waggon spring, with body attached, $23.

H. W. Pell, Rome, N. Y., certificate of high merit; side-bar waggon spring, with body attached, for four persons, $30.

C. Phelps, Taberg, N. Y., certificate of merit; hold-back attachment to harness and shafts.

MANUFACTURES, HAND WORK (ORNAMENTAL AND USEFUL), INVENTIONS, MODELS, ETC.

W. G. Flanders & Co., Lansingburgh, N. Y., certificate of merit; Flanders' domestic steam cooker No. 2, $5.50; No. 5, $7.50.

Mrs. A. B. C. Diefendorf, Rome, N. Y., certificate of high merit; assortment of ladies' hair goods.

J. M. Gray, Hamilton, N. Y., certificate of merit; weather strips for doors and windows.

J. O. Lamson, Rome, N. Y., certificate of high merit; exhibition of fancy wood manufactures, easels, brackets, thermometers, Swiss clocks, etc., etc.

John N. Meyer, Hamilton, N. Y., certificate of merit; new invention in horse shoes.

C. Palmer & Son, Utica, N. Y., certificate of high merit; exhibition of ornamental iron work, settees, chairs, vases, fences, etc., etc.

Price & Knickerbocker, Albany, N. Y. bronze medal; copper weather vanes.

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H. W. Hadley, Lodi, N. Y., certificate of high merit; farm gates.
Cortland Wagon Co., Cortland, N. Y., certificate of high merit; side-spring piano box open waggon.
B. T. Daniels, Utica, N. Y., certificate of merit; small rotary churns.
Newton & Tuttle, Kalamazoo, Mich., certificate of high merit; waggon shafts.
W. P. Kelly, Oneida, N. Y., certificate of merit; set of carriage springs, with attachments.

FARM PRODUCE.

GRAIN, SEEDS, ETC. — GROWN IN 1879 — WHITE WINTER WHEAT.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $10; Clawson.
William P. Ottley, Phelps, N. Y., second prize, $5.

RED WINTER WHEAT.

A. M Potter, Ridge Mills, N. Y., first prize, $10; Lancaster.
E. Van Allen, Bethlehem Centre, N. Y., second prize, $5.

WINTER RYE.

Howard Blessing, Slingerlands, N. Y., first prize, $10.
E. Van Allen, Bethlehem Centre, N. Y., second prize, $5.

WHITE OATS.

F. S. Blessing, Slingerlands, N. Y., first prize, $10.
W. P. Ottley, Phelps, N. Y., second prize, $5.

BLACK OR GRAY OATS.

E. Van Allen, Bethlehem Centre, N. Y., second prize, $5.

TWO-ROWED SPRING BARLEY.

Stryker & Jones, Rome, N. Y., first prize, $10.

FOUR-ROWED SPRING BARLEY.

W. P. Ottley, Phelps, N. Y., first prize, $10.

YELLOW INDIAN CORN (SHELLED).

E. Van Allen, Bethlehem Centre, N. Y., first prize, $10.

FIELD BEANS (LARGE).

F. S. Blessing, Slingerlands, N. Y., first prize, $10.
F. S. Blessing. Slingerlands, N. Y., second prize, $5.

BUCKWHEAT.

George W. Kinney, Stanwix, N. Y., first prize, $5.
J. F. Tillinghast, Factoryville, Penn., second prize, $3.

TIMOTHY SEED.

O. B. Sheaf, East Schuyler, N. Y., first prize, $5.
Deloss Wentworth, Mohawk, N. Y., second prize, $3.

MILLET.

F. S. Blessing, Slingerlands, N. Y., first prize, $5.

SORGHUM SEED.

J. F. Tillinghast, Factoryville, Pa., second prize, $3.

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TWENTY-FIVE EARS OF YELLOW CORN, EIGHT-ROWED.

Morgan Decker, Owego, N. Y., first prize, $5.
Harvey Wood, West Schuyler, N. Y., second prize, $3.

TWENTY FIVE EARS OF YELLOW CORN, TWELVE-ROWED.

Morgan Decker, Owego, N. Y., first prize, $5.
W. A. & J. F. Barns, Kirkland, N. Y., second prize, $3.

TWENTY-FIVE EARS OF WHITE CORN.

Harvey Wood, West Schuyler, N. Y., second prize, $3.

TWENTY-FIVE EARS OF EARLY SWEET CORN.

Stryker & Jones, Rome, N. Y., first prize, $5.
Seth Bonfoy, West Winfield, N. Y., second prize, $3.

TWENTY-FIVE EARS OF LATE SWEET CORN.

Stryker & Jones, Rome, N. Y., first prize, $5.
Harvey Wood, West Schuyler, N. Y., second prize, $3.

VEGETABLES — CELERY.

William Treen, Utica, N. Y., first prize, $3.
Stephen Treen, Utica, N. Y., second prize, $2.

CAULIFLOWERS.

Michael Torpy, Utica, N. Y., first prize, $3.

CABBAGES.

Lewis Brewer, Schenectady, N. Y., first prize, $3.
Michael Torpy, Utica, N. Y., second prize, $2.

LETTUCE.

Michael Torpy, Utica, N. Y., first prize, $3.
Lewis Brewer, Schenectady, N. Y., second prize, $2.

TURNIPS.

W. A. & J. F. Barns, Kirkland, N. Y., first prize, $3.
Lewis Brewer, Schenectady, N. Y., second prize, $2.

MANGOLDS.

S. Hoxie, Whitestown, N. Y., first prize, $3.
T. R. Proctor, Utica, N. Y., second prize, $2.

BEETS.

Charles N. Tuttle, Clockville, N. Y., first prize, $3.
Lewis Brewer, Schenectady, N. Y., second prize, $2.

ORANGE CARROTS.

T. R. Proctor, Utica, N. Y., first prize, $3.
E. Van Allen, Bethlehem Centre, N. Y., second prize, $2.

WHITE CARROTS.

Michael Torpy, Utica, N. Y., first prize, $3.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $2.

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PARSNIPS.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $3.
Lewis Brewer, Schenectady, N. Y., second prize, $2.

SALSIFY.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $3.
William Treen, Utica, N. Y., second prize, $2.

KOHL-RABI.

F. C. Brehm, Waterloo, N. Y., first prize, $3.
E. Van Allen, Bethlehem Centre, N. Y., second prize, $2.

ONIONS.

Michael Torpy, Utica, N. Y., first prize, $3.
E. Van Allen, Bethlehem Centre, N. Y., second prize, $2.

TOMATOS.

Michael Torpy, Utica, N. Y., first prize, $3.
Charles N. Tuttle, Clockville, N. Y., second prize, $2.

EGG PLANTS.

Michael Torpy, Utica, N. Y., first prize, $3.
Samuel Slade, Utica, N. Y., second prize, $2.

GARDEN BEANS.

Oscar S. Lewis, Schodack Centre, N. Y., first prize, $3.
F. S. Blessing, Slingerlands, N. Y., second prize, $2

PEPPERS.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $3.
Michael Torpy, Utica, N. Y., second prize, $2.

SQUASHES.

Michael Torpy, Utica, N. Y., first prize, $3.
Lewis Brewer, Schenectady, N. Y., second prize, $2.

PUMPKINS.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $3.

POTATOES — COLLECTIONS OF EARLY VARIETIES.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $10.
Lewis Brewer, Schenectady, N. Y., second prize, $5.

POTATOES — COLLECTIONS OF LATE VARIETIES.

Oscar J. Lewis, Schodack Centre, N. Y., first prize $10.
Lewis Brewer, Schenectady, N. Y., second prize, $5.

POTATOES — COLLECTIONS OF STOCK-FEEDING VARIETIES.

J. F. Tillinghast, Factoryville, Penn., first prize, $10.
A. S. Johnson, Chili Station, N. Y., second prize, $5.

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DAIRY PRODUCE, ETC.

BUTTER.

Special prize for the best six packages, of not less than thirty pounds net each, made in in the same creamery or private dairy.

O. & A. F. Risley, New York Mills Cold Spring Creamery, New York Mills, N. Y., prize, $50.

PACKAGES OF NOT LESS THAN THIRTY POUNDS NET, MADE AT ANY TIME IN CREAMERY.

W. R. Slaughter, Frankfort Hill, N. Y., second prize, $20.

PACKAGES OF NOT LESS THAN THIRTY POUNDS NET, MADE IN JUNE IN PRIVATE DAIRY.

William F. Ford, West Davenport, N. Y., first prize, $30.
Deloss Wentworth, Mohawk, N. Y., second prize, $20.
Andrew C. Biggar, Pepacton, N. Y., third prize, $10.

PACKAGES OF NOT LESS THAN THIRTY POUNDS NET, MADE AT ANY TIME, IN PRIVATE DAIRY.

Morgan Decker, Owego, N. Y., first prize, $30.
Andrew C. Biggar, Pepacton, N. Y., second prize, $20.
Morgan Wood & Bro., West Martinsburgh, N. Y., third prize, $10.

FIVE POUNDS IN PRINTS, MOULDS OR ROLLS.

L. W. Ledyard, Cazenovia, N. Y., first prize, $10.
T. A. Cole, Solsville, N. Y., second prize, $5.

CHEESE.

Special prize for the best dozen cheeses, of not less than twenty pounds each, from the same factory or dairy, and suitable for army and other uses.

L. L. Wight, Whitesboro, N. Y., prize, $50.

AMERICAN CHEESES, FACTORY OR OTHER, NOT LESS THAN TWENTY POUNDS IN WEIGHT, OVER ONE YEAR OLD.

Seth Bonfoy, West Winfield, N. Y., first prize, $30.
S B. Douglass, Reed's Corners, N. Y., second prize, $20.
W. H. Spooner, Walworth, N. Y., third prize, $10.

AMERICAN CHEESES, FACTORY OR OTHER, NOT LESS THAN TWENTY POUNDS IN WEIGHT, LESS THAN ONE YEAR OLD.

L. L. Wight, Whitesboro, N. Y., first prize, $30.
G. A. Bonfoy, Constableville, N. Y., second prize, $20.
W. H. Spooner, Walworth, N. Y., third prize, $10.

FIVE IMITATION ENGLISH CHEESES.

Gerry Bartlett, Laona, N. Y., second prize, $5.

IMITATION STILTON CHEESE.

W. H. Spooner, Walworth, N. Y., first prize, $10.
Gerry Bartlett, Laona, N. Y., second prize, $5.

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RENNETS.

Mrs. Seth Bonfoy, West Winfield, N. Y., first prize, $10.
A. Stone, Stanwix, N. Y., second prize, $5.

WHEATEN BREAD

S. B. Douglass, Reed's Corners, N. Y., first prize, $5.
E. Van Allen, Bethlehem Centre, N. Y., second prize, $3.

RYE BREAD.

Stryker & Jones, Rome, N. Y., first prize, $5.
E. Van Allen, Bethlehem Centre, N. Y., second prize, $3.

INDIAN OR RYE AND INDIAN BREAD.

Mrs. M. S. Blessing, Slingerlands, N. Y., first prize, $5.
Mrs. Seth Bonfoy, West Winfield, N. Y., second prize, $3.

MAPLE SUGAR.

William F. Ford, West Davenport, N. Y., first prize, $5.

MAPLE SYRUP.

William F. Ford, West Davenport, N. Y., first prize, $5.
Mrs. W. H. Graves, Blossvale, N. Y., second prize, $3.

PRESERVED FRESH FRUITS.

Charles N. Tuttle, Clockville, N. Y., first prize, $5.
E. Van Allen, Bethlehem Centre, N. Y., second prize, $3.

PICKLES IN VINEGAR.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $5.
Phebe M. Glatt, New York Mills, N. Y., second prize, $3.

DRIED APPLES.

Lewis Brewer, Schenectady, N. Y., first prize, $5.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $3.

DRIED PEACHES.

Mrs. C. M. Stone, Blossvale, N. Y., second prize, $3.

DRIED WHORTLEBERRIES.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $5.
Mrs. C. M. Stone, Blossvale, N. Y., second prize, $3.

DRIED RASPBERRIES.

A. Stone, Stanwix, N. Y., first prize, $5.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $3.

BOX HONEY.

P. Miller, Fredonia, N. Y., first prize, $5.
W. E. Clark & Son, Oriskany, N. Y., second prize, $3.

EXTRACTED OR STRAINED HONEY.

W. E. Clark & Son, Oriskany, N. Y., first prize, $5.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $3.

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DOMESTIC MANUFACTURES.

WOOLEN BLANKETS.

Mrs. W. C. Burritt, Paris, N. Y., first prize, $5.
D. C. Besse, Stanwix, N. Y., second prize, $3.

ALL-WOOL HORSE BLANKETS.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $5.
Deloss Wentworth, Mohawk, N. Y, second prize, $3.

WOOLEN CLOTH.

Deloss Wentworth, Mohawk, N. Y., first prize, $5.
Mrs C. M. Stone, Blossvale, N. Y., second prize, $3.

WOOLEN FLANNEL.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $5.
D. C. Besse, Stanwix, N. Y., second prize, $3

FLANNEL WITH COTTON WARP.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $5.
Mrs. W. H. Graves, Blossvale, N. Y., second prize, $3.

LINSEY WOOLSEY.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $5.

COTTON AND WOOL KERSEY.

Mrs. C. M. Stone, Blossvale, N. Y., second prize, $3.

RAG CARPET.

Jared Van Wagenen, Lawyersville, N. Y., first prize, $5.
Mrs. Seth Bonfoy, West Winfield, N. Y., second prize, $3.

HEARTH RUGS.

Mrs. C. F. Eldred, New Hartford, N. Y., first prize, $5.
Mrs. Ward Hubbard, Watertown, N. Y., second prize, $3.

DOUBLE CARPET COVERLETS.

Mrs. C. M. Stone, Blossvale, N. Y., second prize, $3.

LINEN CLOTH.

Mrs. C. M. Stone, Blossvale, N. Y., second prize, $3.

LINEN KERSEY.

Mrs. W. H. Graves, Blossvale, N. Y., second prize, $3.

TOW CLOTH.

Mrs. W. H. Graves, Blossvale, N. Y., second prize, $3.

KNIT BED SPREADS.

Mrs. Ward Hubbard, Watertown, N. Y., first prize, $3.
Mrs. Milton H. Thomson, Utica, N. Y., second prize, $2.

WHITE WORKED OR QUILTED BED SPREADS.

Mrs. B. G. Chapman, Clayville, N. Y., first prize, $3.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $2.

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BALMORAL PETTICOATS.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $3.
Mrs. W. H. Graves, Blossvale, N. Y., second prize, $2.

WOOLEN KNIT STOCKINGS.

Mrs. W. C. Burritt, Paris, N. Y., first prize, $3.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $2.

WORSTED KNIT STOCKINGS.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $3.

WOOLEN KNIT MITTENS.

Mrs. Ward Hubbard, Watertown, N. Y., first prize, $3.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $2.

WOOLEN FRINGE MITTENS.

Mrs. C. M. Stone, Blossvale, N. Y., second prize, $2.

LINEN OR COTTON KNIT STOCKINGS.

A. Stone, Stanwix, N. Y., first prize, $3.
Mrs. W. C. Burritt, Paris, N. Y., second prize, $2.

LINEN SEWING THREAD.

Mrs. W. H. Graves, Blossvale, N. Y., second prize, $2.

EXTRA ENTRIES COMMENDED.

Miss Jenny E. Baker, Marcy, N. Y., crochet, worsted and fancy work.
Mrs. T. H. Cackett, Deansville, N. Y., specimen of chenille embroidery.
Miss Ophelia K. Shepard, Mohawk, N. Y., lady's fancy work.

FLOWERS, PLANTS AND FRUITS.

FLOWERS — PROFESSIONAL LIST — COLLECTIONS OF CUT FLOWERS.

James Vick, Rochester, N. Y., first prize, $10.

COLLECTIONS OF ROSES.

Ellwanger & Barry, Rochester, N. Y., first prize, $6.

TWENTY-FOUR ROSES.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.

TWELVE ROSES.

Ellwanger & Barry, Rochester, N. Y., first prize, $3.

COLLECTIONS OF ANNUAL PHLOXES.

James Vick, Rochester, N. Y., first prize, $5.

TWELVE PERENNIAL PHLOXES.

James Vick, Rochester, N. Y., first prize, $3.

COLLECTIONS OF VERBENAS.

James Vick, Rochester, N. Y., first prize, $5.

TWELVE VERBENAS.

James Vick, Rochester, N. Y., first prize, $3.

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AMERICAN SEEDLING VERBENA.

James Vick, Rochester, N. Y., first prize, $1.

COLLECTIONS OF ASTERS.

James Vick, Rochester, N. Y., first prize, $3.
George Boyce, Utica, N. Y., second prize, $2.

COLLECTIONS OF LILIES.

James Vick, Rochester, N. Y., first prize, $3.

COLLECTIONS OF PANSIES.

Albert Dohles, Waterloo, N. Y., first prize, $3.

COLLECTIONS OF TEN WEEKS' STOCKS.

James Vick, Rochester, N. Y., first prize, $3.

COLLECTIONS OF GLADIOLUS.

James Vick, Rochester, N. Y., first prize, $3.

TWELVE VARIETIES OF GLADIOLUS.

James Vick, Rochester, N. Y., first prize, $2.

AMATEUR LIST — COLLECTIONS OF CUT FLOWERS.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $10.
E. Van Allen, Bethlehem Centre, N. Y., second prize, $5.

COLLECTIONS OF DAHLIAS.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $6.
A. Stone, Stanwix, N. Y., second prize, $3.

COLLECTIONS OF ROSES.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $6.

SIX ROSES.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $2.

COLLECTIONS OF VERBENAS.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $5.
A. Stone, Stanwix, N. Y., second prize, $3.

TWELVE VERBENAS.

A. Stone, Stanwix, N. Y., first prize, $3.
E. Van Allen, Bethlehem Centre, N. Y., second prize, $2.

SIX VERBENAS.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $2.
E. Van Allen, Bethlehem Centre, N. Y., second prize, $1.

COLLECTIONS OF PHLOXES.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $5.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $3.

COLLECTIONS OF ASTERS.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $3.
A. Stone, Stanwix, N. Y., second prize, $2.

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COLLECTIONS OF PANSIES.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $3.
E. Van Allen, Bethlehem Centre, N. Y., second prize, $2.

COLLECTIONS OF TEN WEEKS' STOCKS.

A. Stone, Stanwix, N. Y., first prize, $3.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $2.

COLLECTIONS OF GLADIOLUS.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $3.
A. Stone, Stanwix, N. Y., second prize, $2.

COLLECTIONS OF EVERLASTING FLOWERS.

A. Stone, Stanwix, N. Y., first prize, $3.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $2.

BOUQUETS, FLORAL DESIGNS, ETC. — OPEN TO ALL — HAND BOUQUETS.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.

TABLE BOUQUETS.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.

BUTTON-HOLE BOUQUETS.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $3.
E. Van Allen, Bethlehem Centre, N. Y., second prize, $2.

BASKETS OF FLOWERS.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.

FRUITS.

PROFESSIONAL LIST — COLLECTIONS OF APPLES.

Ellwanger & Barry, Rochester, N. Y., first prize, $10.

TWENTY VARIETIES OF APPLES.

Ellwanger & Barry, Rochester, N. Y., first prize, $8.

TEN VARIETIES OF APPLES.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.

COLLECTIONS OF PEARS.

Ellwanger & Barry, Rochester, N. Y., first prize, $15.
W. Garlock, Utica, N. Y., second prize, $10

TWENTY VARIETIES OF PEARS.

Ellwanger & Barry, Rochester, N. Y., first prize, $10.

TEN VARIETIES OF PEARS.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.

COLLECTIONS OF PEACHES.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.

ONE VARIETY OF PEACHES.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

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COLLECTIONS OF PLUMS.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.

FIVE VARIETIES OF PLUMS.

Ellwanger & Barry, Rochester, N. Y., first prize, $3.

ONE VARIETY OF PLUMS.

D. S. Marvin, Watertown, N. Y., first prize, $2.
Ellwanger & Barry, Rochester. N. Y., second prize, $1.

QUINCES.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

COLLECTIONS OF NATIVE GRAPES.

Ellwanger & Barry, Rochester, N. Y., first prize, $10.
D. S. Marvin, Watertown. N. Y., second prize, $5.

FIVE VARIETIES OF NATIVE GRAPES.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.
T. Ward, Utica, N. Y., second prize, $3.

COLLECTIONS OF FOREIGN GRAPES.

T. Ward, Utica, N. Y., second prize, $5.

AMATEUR LIST — TWENTY VARIETIES OF APPLES.

J. Van Dorn, Ithaca, N. Y., first prize, $10.
A. S. Johnson, Chili Station, N. Y., second prize, $5.

TEN VARIETIES OF APPLES.

J Van Dorn, Ithaca, N. Y., first prize, $5.
J Houck, New Hartford, N. Y., second prize, $3.

FIVE VARIETIES OF APPLES.

J. Van Dorn, Ithaca, N. Y., first prize, $3.
E. Van Allen, Bethlehem Centre, N. Y., second prize, $2.

TEN VARIETIES OF PEARS.

M. E. Myers, Charlton, N. Y., second prize, $3.

FIVE VARIETIES OF PEARS.

M. E. Myers, Charlton, N. Y., first prize, $3.
A. S. Johnson, Chili Station, N. Y., second prize, $2

FIVE VARIETIES OF PEACHES.

E. Van Allen, Bethlehem Centre, N. Y., second prize, $2.

ONE VARIETY OF PEACHES.

E. Van Allen, Bethlehem Centre, N. Y., second prize, $1.

FRUITS — SINGLE DISHES — OPEN TO ALL.

APPLES — FALL PIPPINS.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $2.

GRAVENSTEINS.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

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BALDWINS.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

KING OF TOMPKINS COUNTY.

C. W. Eells, Clinton, N. Y., first prize, $2.

RHODE ISLAND GREENINGS.

C. W. Eells, Clinton, N. Y., first prize, $3.

TWENTY OUNCE.

C. W. Eells, Clinton, N. Y., first prize, $3.

PEARS — BARTLETT.

J. Van Dorn, Ithaca, N. Y., first prize, $2.

BEURRE D'ANJOU.

Ellwanger & Barry, Rochester, N. Y., first prize, $3.

BEURRE CLAIRGEAU.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

BEURRE BOSC.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

DUCHESSE D'ANGOULEME.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

DOYENNE BOUSSOCK.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

FLEMISH BEAUTY.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

SECKEL.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

SHELDON.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

LAWRENCE.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

WINTER NELIS.

Ellwanger & Barry, Rochester, N. Y., first prize, 2$.

GRAPES — CONCORD.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

DELAWARE.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

HARTFORD.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

ANY OF ROGERS' VARIETIES.

Ellwanger & Barry, Rochester, N. Y., first prize, $3.

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AWARDS

At the Fortieth Annual Cattle Show and Fair of the New York State Agricultural Society, held at Albany, September 13 to September 17, 1880.

CATTLE.

SHORTHORNS—SHORTHORN HERD PRIZE.

D. B. Haight, Dover Plains, N. Y., large gold medal.

Bull, Oneida Prince, red, bred by A. W. Griswold, Morristown, Vt., calved October 25, 1875, sire Seventh Duke of Oneida 19056, dam Lady Mary by Hotspur 4030 (31393), gr. d. Baroness by Barrington 1220 (30501).

Cow, Constance of Lyndale 2nd, white, bred by W. S. King, Minneapolis, Minn., calved November 12, 1871, sire Scotsman (27435), dam Constance 6th by Seventh Duke of Airdrie (23718), gr. d. Constance 3rd by Clifton Duke (23580).

Cow, Constance of Lyndale 8th, roan, bred by W. S. King, Minneapolis, Minn., calved March 10, 1876, sire Seventh Lord Oxford 17586, dam Constance of Lyndale 2nd by Scotsman (27435), gr. d. Constance 6th by Seventh Duke of Airdrie (23718).

Heifer, Constance of Brookdale 4th, roan, bred by exhibitor, calved September, 24, 1878, sire Oneida Prince 27359, dam Constance 6th by Seventh Duke of Airdrie (23718), gr. d. Constance 3rd by Clifton Duke (23580).

Heifer, Constance of Brookdale 5th, roan, bred by exhibitor, calved May 18, 1879, sire Oneida Prince 27359, dam Constance of Lyndale 8th by Seventh Lord Oxford 17586, gr. d. Constance of Lyndale 2nd by Scotsman (27435).

Heifer, Constance of Brookdale 6th, roan, bred by exhibitor, calved June 20, 1879, sire Oneida Prince 27359, dam Constance of Lyndale 2nd by Scotsman (27435) gr. d. Constance 6th by Seventh Duke of Airdrie (23718).

BULLS OVER THREE YEARS OLD.

N. M. Curtis, Ogdensburgh, N. Y., first prize, $50; Baron Hillhurst, red with a little white, bred by exhibitor, calved December 26, 1874, sire Second Duke of Hillhurst 12893, dam Lady Mary 5th by Star of the Realm 11021, gr. d. Lady Mary 2nd by Climax 5453.

Wm. S. Moore, Jr., Mt. Upton, N. Y., second prize, $25; Lord Upton, roan, bred by exhibitor, calved May 20, 1877, sire Beau of Winfield 28376, dam Lady Morris by Lord Eldon 12318, gr. d. Nannie Morris by Master Balco 3135.

BULLS TWO YEARS OLD.

F. B. Redfield, Batavia, N. Y., first prize, $40; Constance Duke, roan, bred by D. B. Haight, Dover Plains, N. Y., calved February 13, 1878, sire Oneida Prince 27359, dam Constance 2nd of Lyndale by Scotsman (27435), gr. d. Constance 6th by Seventh Duke of Airdrie (23718).

BULLS ONE YEAR OLD.

D. B. Haight, Dover Plains, N. Y., first prize, $30; Fourth Baron of Brookdale, red, bred by exhibitor, calved February 24, 1879, sire Baron of Brookdale 28511, dam Lady Mary 10th by Earl of Seaham 8077, gr. d. Lady Mary 2nd by Climax 5453.

G. H. Bell, Rome, N. Y., second prize, $15; Seventh Duke of Skaneateles, roan, bred by J. H. Earll, Skaneateles, N. Y., calved March 10, 1879, sire Third Duke

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of Skaneateles 29365, dam Cochat 8th by Duke of Skaneateles 16925, gr. d. Cochat 2nd by Castor 5434.

BULL CALVES.

D. B Haight, Dover Plains, N. Y., first prize, $10; Waterloo 2nd, red, bred by exhibitor, calved March 11, 1880, sire Baron of Brookdale 28511, dam Constance of Brookdale by Wildeyes Duke 21325, gr. d. Constance 6th by Seventh Duke of Airdrie (23718).

N. M Curtis, Ogdensburgh, N. Y., second prize, $5; Second Baron St. Lawrence, red with a little white, bred by exhibitor, calved January 27, 1880, sire 13th Baron Morley 28541, dam Lady Mary 5th by Star of the Realm 11031, gr. d. Lady Mary 2nd by Climax 5453.

COWS OVER THREE YEARS OLD.

D. B. Haight, Dover Plains, N. Y., first prize, $40; Constance of Lyndale 8th, roan, bred by W. S. King, Minneapolis, Minn., calved March 10, 1876, sire Seventh Lord Oxford 17586, dam Constance of Lyndale 2nd by Scotsman (27435), gr. d. Constance 6th by Seventh Duke of Airdrie (23718).

Benjamin Fellows, Clifton, N. Y., second prize, $20; Lily of the Valley, light roan, bred by George Butts, Manlius, N. Y., calved April 28, 1871, sire Treble Gloster 7331, dam White Lily by Bancroft 5341, gr. d. Lucia by Idle Duke 4902.

HEIFERS TWO YEARS OLD.

Benjamin Fellows, Clifton, N, Y., first prize, $30; Niobe 2nd, red with a little white, bred by exhibitor, calved March 7, 1878, sire Treble Gloster 7331, dam Niobe 1st by Major 10425, gr. d. Niobe by Clifton Duke 2nd 7711.

Benjamin Fellows, Clifton, N. Y., second prize, $15; Niobe 3rd, red with a little white, bred by exhibitor, calved March 25, 1878, sire Treble Gloster 7331, dam Niobe by Clifton Duke 2nd 7711, gr. d. Nannie Williams 10th by Duke of Airdrie 2743.

HEIFERS ONE YEAR OLD.

D. B. Haight, Dover Plains, N. Y., first prize, $20; Constance of Brookdale 4th, roan, bred by exhibitor, calved September 24, 1878, sire Oneida Prince 27359, dam Constance 6th by Seventh Duke of Airdrie (23718), gr. d. Constance 3rd by Clifton Duke (23580).

D. B. Haight, Dover Plains, N. Y., second prize, $10; Constance of Brookdale 5th, roan, bred by exhibitor, calved May 18, 1879, sire Oneida Prince 27359, dam Constance of Lyndale 8th by Seventh Lord Oxford 17586, gr. d. Constance of Lyndale 2nd by Scotsman (27435).

HEIFER CALVES.

Benjamin Fellows, Clifton, N. Y., first prize, $10; Niobe 5th, red, bred by exhibitor, calved February 6, 1880, sire Earl of Oxford 29478, dam Niobe 2nd by Treble Gloster 7331, gr. d. Niobe 1st by Major 10425.

N. M. Curtis, Ogdensburgh, N. Y, second prize, $5; Joan 12th, bred by exhibitor, calved January 17, 1880, sire 13th Baron Morley 28541, dam Joan 5th by Constantius 13709, gr. d. Joan 2nd by Nimrod 10533.

DEVONS—DEVON HERD PRIZE.

Joseph Hilton, New Scotland, N. Y., large gold medal.

Bull, Crown Prince, bred by exhibitor, calved November 25, 1875, sire Prince of Wales 652, dam Edith 6th by Prince of Wales 652, gr. d. Edith 3rd by Sachem (517).

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Cow, Edith 6th, bred by exhibitor, calved November 5, 1872, sire Prince of Wales 652, dam Edith 3rd by Sachem (517), gr. d. Edith, imported by Lewis G. Morris.

Cow, Edith 12th, bred by exhibitor, calved December 13, 1875, sire Prince of Wales 652, dam Edith 4th by Prince of Wales, 652, gr. d. Edith 2nd by Sachem (517).

Heifer, Edith 13th, bred by exhibitor, calved December 11, 1877, sire Prince of Wales 11th 1025, dam Edith 7th by Prince of Wales 652, gr. d. Edith 2nd by Sachem (517).

Heifer, Edith 14th, bred by exhibitor, calved January 3, 1878, sire Crown Prince 809, dam Edith 4th by Prince of Wales 652, gr. d. Edith 2nd by Sachem (517).

Heifer Edith 17th, bred by exhibitor, calved March 27, 1879, sire Crown Prince 809, dam Edith 6th by Prince of Wales 652, gr. d. Edith 3rd by Sachem (517).

BULLS OVER THREE YEARS OLD.

Joseph Hilton, New Scotland, N. Y., first prize, $50; Crown Prince, bred by exhibitor, calved November 25, 1875, sire Prince of Wales 652, dam Edith 6th by Prince of Wales 652, gr. d. Edith 3rd by Sachem (517).

J. A. Pomeroy, Sidney Centre, N. Y., second prize, $25; Hartland, bred by Truman Baker, Earlville, N. Y., calved March 23, 1877, sire Lord Nelson 9494, dam Fancy by Mohawk 610, gr. d. Cherry by Young Baltimore 599, H.

BULLS TWO YEARS OLD.

A. F. Bronson, Vernon, N. Y., first prize, $40; Brant, bred by exhibitor, calved March 20, 1878, sire Litchfield 947, dam Cherry by Young Baltimore 599, H., gr. d. Flora by Sir Walter Raleigh 560, H.

David Wait, Wells Bridge, N. Y., second prize, $20; Delaware, bred by J. A. Pomeroy, Sidney, N. Y., calved March 3, 1878, sire Frank Chapman 859, dam Jenny Lind 8th by Mohawk 610, gr. d. Jenny Lind by Frank Baker 38.

BULLS ONE YEAR OLD.

Joseph Hilton, New Scotland, N. Y., first prize, $30; Prince of Wales 20th, bred by exhibitor, calved December 12, 1878, sire Crown Prince 809, dam Edith 9th by Prince of Wales 652, gr. d. Fanny by Prince of Wales 652.

J. S. Titus, Washington Depot, Conn., second prize, $15; John, bred by exhibitor, calved March 10, 1879, sire Sam 2nd, dam Nellie 2nd by Hollister 908, gr. d. Nelly by Prince John 3rd 91.

BULL CALVES.

Joseph Hilton, New Scotland, N. Y., first prize, $10; Prince of Wales 21st, bred by exhibitor, calved March 21, 1880, sire Crown Prince 809, dam Edith 6th by Prince of Wales 652, gr. d Edith 3rd by Sachem (517).

A. F. Bronson, Vernon, N. Y., second prize, $5; Zib, bred by exhibitor, calved April 1, 1880, sire Lord Nelson 2nd 1267, dam Cherry 3rd by Mohawk 610, gr. d. Cherry by Young Baltimore 599, H.

COWS OVER THREE YEARS OLD.

J. S. Titus, Washington Depot, Conn., first prize, $40; Nelly 2nd, bred by exhibitor, calved March 18, 1878, sire Hollister 908, dam Nelly by Prince John 3rd 91, gr. d. May 2nd by Bobolink 12.

Joseph Hilton, New Scotland, N. Y., second prize, $20; Edith 6th, bred by exhibitor, calved November 5, 1872, sire Prince of Wales 652, dam Edith 3rd by Sachem (517), gr. d. Edith, imported by Lewis G. Morris.

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HEIFERS TWO YEARS OLD.

Joseph Hilton, New Scotland, N. Y., first prize, $30; Edith 13th, bred by exhibitor, calved December 11, 1877, sire Prince of Wales 11th 1025, dam Edith 7th by Prince of Wales 632, gr. d. Edith 2nd by Sachem (517).

J. S. Titus, Washington Depot, Conn, second prize, $15; Fanny Pedley 3rd, bred by exhibitor, calved July 10, 1878, sire Duke of Washington 837, dam Fanny Pedley 2nd by Sam 1054, gr. d. Fanny Pedley by Weehawken 141.

HEIFERS ONE YEAR OLD.

Joseph Hilton, New Scotland, N. Y., first prize, $20; Edith 17th, bred by exhibitor, calved March 27, 1879, sire Crown Prince 809, dam Edith 6th by Prince of Wales 652, gr. d. Edith 3rd by Sachem (517).

A. F. Bronson, Vernon, N. Y., second prize, $10; Hollyberry, bred by exhibitor, calved March 31, 1879, sire Doctor 819½, dam Verna by Litchfield 947, gr. d. Belle by Grant 533.

HEIFER CALVES.

J. A. Pomeroy, Sidney Centre, N. Y., second prize; $5; Lady Evelyn, bred by exhibitor, calved March 29, 1880, sire Hartland 1234, dam Jenny Lind 8th by Mohawk 610, gr. d. Jenny Lind 6th by Frank Baker 38.

HEREFORDS—HEREFORD HERD PRIZE.

Erastus Corning, Albany, N. Y., large gold medal.

Bull, Comus, red, with white face, bred by P. Turner, Pembridge, Herefordshire, England, calved July 21, 1872, sire Provost (4067), dam Kathleen by Bolingbroke (1883), gr. d. Redwing by Felix (953).

Cow, Marchioness 2nd, red, with white face, bred by exhibitor, calved April, 1869, sire Major, dam Marchioness by Washington (5134), gr. d. Lady.

Cow, Victoria 6th, red, with white face, bred by exhibitor, calved June 12, 1874, sire Taurus, dam Victoria 5th by S. Goddard, gr. d. Victoria 4th by Cardinal Wiseman.

Cow, Katy, red, with white face, bred by exhibitor, calved April, 1875, sire Comus (4457), dam Princess 2nd by Washington (5134), gr. d. Princess.

Cow, Topsy Turvy, red, with white face, bred by exhibitor, calved March 13, 1877, sire Comus (4457), dam Topsy by Taurus, gr. d. Marchioness 2nd by Major.

Heifer, Edna, red, with white face, bred by exhibitor, calved February 9, 1879, sire, Comus (4557), dam Victoria 6th by Taurus, gr. d. Victoria 5th by S. Goddard.

BULLS OVER THREE YEARS OLD.

Erastus Corning, Albany, N. Y., first prize, $50; Comus, red, with white face, bred by P. Turner, Pembridge, Herefordshire, England, calved July 21, 1872, sire Provost (4067), dam Kathleen by Bolingbroke (1883), gr. d. Redwing by Felix (953).

BULLS TWO YEARS OLD.

Burleigh & Bodwell, Fairfield Centre, Me., first prize, $40; Prince Imperial, red, with white face, bred by G. S. Burleigh, Mechanicsville, Iowa, calved January 18, 1878, sire Advance, dam Princess B. by Sir Charles (3434), gr. d. Princess 3rd by Sailor (2200).

BULLS ONE YEAR OLD.

Burleigh & Bodwell, Fairfield Centre, Me., first prize, $30; Anxiety 2nd, red, with white face, bred by T. J. Carwardine, Leominster, England, calved May 15, 1879, sire Anxiety (5188), dam Alice by Longhorns (4711), gr. d. by De Cote (3060).

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BULL CALVES.

Erastus Corning, Albany, N. Y., first prize, $10; Victor, red, with white face, bred by exhibitor, calved December 26, 1879, sire Comus (4457), dam Victoria 6th by Taurus, gr. d. Victoria 5th by S. Goddard.

Burleigh & Bodwell, Fairfield Centre, Me., second prize, $5; Senator, red, with white face, bred by H. C. Burleigh, calved February 20, 1880, sire Prince Imperial, dam Verbena 5th by Compton Lad (3764), gr. d. Verbena 2nd by Guelph (2023).

COWS OVER THREE YEARS OLD.

Burleigh & Bodwell, Fairfield Centre, Me., first prize, $40; Lemon, red, with white face, bred by B. Rogers, Pembridge, Herefordshire, England, calved July, 1876, sire Earl 2nd (5048), dam Lemon by Sir Thomas (2228) gr. d. Lemon by The Sheriff (2822).

Erastus Corning, Albany, N. Y., second prize, $20; Victoria 6th, red, with white face, bred by exhibitor, calved June 12, 1874, sire Taurus, dam Victoria 5th by S. Goddard, gr. d. Victoria 4th by Cardinal Wiseman.

HEIFERS TWO YEARS OLD.

Burleigh & Bodwell, Fairfield Centre, Me., first prize, $30; Duchess 4th, red, with white face, bred by P. Turner, Pembridge, England, calved April 18, 1878, sire Spartan (5009), dam Duchess by Provost (4067), gr. d. Gwendoline by Franky (1243).

HEIFERS ONE YEAR OLD.

Burleigh & Bodwell, Fairfield Centre, Me., first prize, $20; Marchioness of Lorne, red, with white face, bred by her Majesty the Queen, Windsor, England, calved October 23, 1878, sire Prince Alexander (4859), dam Princess Amelia by Deception (2491), gr. d. Heatherbell by Vanguard (1109).

Erastus Corning, Albany, N. Y., second prize, $10; Edna, red, with white face, bred by exhibitor, calved February 9, 1879, sire Comus (4457), dam Victoria 6th by Taurus, gr. d. Victoria 5th by S. Goddard.

HEIFER CALVES.

Erastus Corning, Albany, N. Y., first prize, $10; Echo, red, with white face, bred by exhibitor, calved January 22, 1880, sire Comus (4457), dam Marchioness 2nd by Major, gr. d. Marchioness by Washington (5184).

Burleigh & Bodwell, Fairfield Centre, Me., second prize, $5; Clara 5th, red, with white face, bred by W. S. Powell, Glamorganshire, Wales, calved January 27, 1880, sire Spartan (5009), dam Clara 4th by Prince Edward 2nd (4042), gr. d. Clara 2nd by Prince Edward (3349).

AYRSHIRES — AYRSHIRE HERD PRIZE.

James F. Converse, Woodville, N. Y., large gold medal.

Bull, Prince Charlie, dark red and white, bred by E. D. Pearce, East Providence, R. I., calved May 15, 1875, sire Trim Douglas 1510, dam Ellen Douglas by Eglinton 21, gr. d. Corslet, imported by H. H. Peters.

Cow, Beulah, mostly red, bred by R. Caldwell, in Scotland, calved June 18, 1869, sire Geordie, dam Queen.

Cow, Peerless, red and white, bred by Robert Orr, in Scotland, imported by exhibitor, calved March, 1871, sire Trump, dam Kitty Clyde.

Cow, Helen Pender, red and white, bred by exhibitor, calved May, 1872, sire Woodville Chief 1542, dam Lady Pender, imported.

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Heifer, Careless, red and white, bred by exhibitor, calved April 20, 1878, sire Kash 1237, dam Minnie 3rd by Woodville Chief 1542, gr. d. Minnie by John Gilpin 222.

Heifer, Jane Garfield, red and white, bred by exhibitor, calved March, 1879, sire Kash 1237, dam Helen Pender by Woodville Chief 1542, gr. d. Lady Pender, imported.

BULLS OVER THREE YEARS OLD.

Herbert Merriam, Weston, Mass., first prize, $50; Lord Douglas, brown and white, bred by E. D. Pearce, Providence, R. I., calved February 24, 1873, sire Sandy Douglas 839, dam Rose Douglas by Black Douglas 99, gr. d. Ellen Douglas by Eglinton 21.

Eugene Ham, Verbank, N. Y., second prize, $25; McWhirter, red and white, bred by S. M. & D. Wells, Wethersfield, Conn., calved March 6, 1877, sire 324 Fortune, dam Amy by 672 Morton, gr. d. Dolly 3rd by 453 Rob Roy.

BULLS TWO YEARS OLD.

Eugene Ham, Verbank, N. Y., first prize, $40; Edgewood 2nd, red and white, bred by exhibitor, calved January 21, 1878, sire 318 Edgewood, dam Miss Dolly by 490 Sultan, gr. d. Dolly by 286 Dandy 5th.

Ormiston Bros., Cuba, N. Y., second prize, $20; Joe Mars, red and white, bred by Jardine & Sons, Hamilton, Canada, calved July, 1878, sire 887 Mars 1st, dam Queen Mary by 773 Cherokee, gr. d. Bonny Jess, imported by Jardine & Sons.

BULLS ONE YEAR OLD.

J. F. Converse, Woodville, N. Y., first prize, $30; Sir Walter, red and white, bred by exhibitor, calved March 28, 1879, sire Woodville Chief 1542, dam Rassie 2nd, imported.

E. B. Hawks, Wells Bridge, N. Y., second prize, $15; Jock, red with a little white, bred by exhibitor, calved April 10, 1879, sire 407 Mikado, dam Bogside 2nd by Peveril 770, gr. d. Bogside by Dundas 532.

BULL CALVES.

J. F. Converse, Woodville, N. Y., first prize, $10; Gayarre, red and white, bred by exhibitor, calved April 4, 1880, sire Woodville Chief 1542, dam Bessie Bell, bred by R. Wier in Scotland, by Gilpin, gr. d. Flecky.

Eugene Ham, Verbank, N. Y., second prize, $5; Laird of Meadow Brook, red and white, bred by exhibitor, calved September 3, 1879, sire 653 McWhirter, dam Ayr of Edgewood 2nd by 189 Robbie Bruce, gr. d. Miss Dolly by 490 Sultan.

COWS OVER THREE YEARS OLD.

J. F. Converse, Woodville, N. Y., first prize, $40; Helen Pender, red and white, bred by exhibitor, calved May, 1872, sire Woodville Chief 1542, dam Lady Pender, imported.

Herbert Merriam, Weston, Mass., second prize, $20; Lady Essex 3rd, red and white, bred by exhibitor, calved August 10, 1875, sire Lord Douglas 1283, dam Lady Essex by Bruce 453, gr. d. Lassie by Baldy 90.

HEIFERS TWO YEARS OLD.

J. F. Converse, Woodville, N. Y., first prize, $30; Careless, red and white, bred by exhibitor, calved April 20, 1878, sire Kash 1237, dam Minnie 3rd by Woodville Chief 1542, gr. d. Minnie by John Gilpin 222.

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Ormiston Bros., Cuba, N. Y., second prize, $15; Duchess of Vinevale, dark red and white, bred by Jardine & Sons, Hamilton, Canada, calved September 22, 1877, sire 887 Mars 1st, dam Bonny Jess, imported by Jardine & Sons.

HEIFERS ONE YEAR OLD.

Ormiston Bros., Cuba, N. Y., first prize, $20; Clara B. Mars, dark red with a little white, bred by Jardine & Sons, Hamilton, Canada, calved September 11, 1878, sire 887 Mars 1st, dam Jean Muir by Billy Muir out of Bonny Jess, both imported by Jardine & Sons.

Eugene Ham, Verbank, N. Y., second prize, $10; Miss Dolly's Daughter, red and white, bred by exhibitor, calved March 16, 1879, sire 818 Edgewood, dam Miss Dolly by 490 Sultan, gr. d. Dolly by 286 Dandy 5th.

HEIFER CALVES.

Eugene Ham, Verbank, N. Y., first prize, $10; Maggie A., red and white, bred by exhibitor, calved March 1, 1880, sire 653 McWhirter, dam Maggie 4th, by 818 Edgewood, gr. d. Maggie 3rd by 69 Earl of Holderness.

G. H. Bell, Rome, N. Y., second prize, $5; Draxy's Daughter, white and red, bred by exhibitor, calved April 5, 1880, sire 813 Gansevoort, dam Draxy Miller by Treasurer 1509, gr. d. Pet by Rob Roy 825.

HOLSTEINS — HOLSTEIN HERD PRIZE.

Gerrit S. Miller, Peterboro, N. Y., large gold medal.

Bull, Billy Boelyn, black and white, calved in 1875, imported from West Friesland by exhibitor in 1876.

Cow, Coronet, white and black, calved March, 1874, imported from North Holland by exhibitor in 1879.

Cow, Ondine, black and white, calved March, 1875, imported from North Holland by exhibitor in 1879.

Cow, Acme, black and white, calved March, 1877, imported from North Holland by exhibitor in 1879.

Heifer, Gem, black and white, calved March 15, 1878, imported from North Holland by exhibitor in 1879.

Heifer, Nannie Smit, black and white, bred by Gerrit Smit in North Holland, calved March 22, 1878, imported by exhibitor in 1879.

BULLS OVER THREE YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $50; Uncle Tom, black and white, bred by Gerritt S. Miller, Peterboro, N. Y., calved April 17, 1875, sire Rip Van Winkle 35, dam Topsy by Hollander 20, gr. d. Dowager, imported by G. S. Miller.

Gerrit S. Miller, Peterboro, N. Y., second prize, $25; Billy Boelyn, black and white, calved in 1875, imported from West Friesland in 1876.

BULLS TWO YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $40; Ebbo, black and white, calved April 2, 1878, imported by George E. Brown, Elgin, Ill., from North Holland, in dam Iona.

Howard G. White, Syracuse, N. Y., second prize, $20; Marssum, black and white, bred by De Peever in Holland, imported by exhibitor, calved May 7, 1878, sire Jakol, dam Oliveer.

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BULL CALVES.

Gerritt S. Miller, Peterboro, N. Y., first prize, $10; Empire, black and white, bred by exhibitor, calved March, 8, 1880, sire Billy Boelyn 189, dam Empress imported from North Holland by exhibitor in 1879.

Smiths & Powell, Syracuse, N. Y., second prize, $5; Victor, black and white, bred by exhibitors, calved March 23, 1880, sire Jacob II (in Holland), dam Aaggie, imported by exhibitors from North Holland in 1879.

COWS OVER THREE YEARS OLD.

Gerrit S. Miller, Peterboro, N. Y., first prize, $40; Ondine, black and white, calved March, 1875, imported from North Holland by exhibitor in 1879.

Smiths & Powell, Syracuse, N. Y., second prize, $20; Netherland Queen, black and white, bred by M. Koning in North Holland, calved March 26, 1877, imported by exhibitors in 1878.

HEIFERS TWO YEARS OLD.

Gerrit S. Miller, Peterboro, N. Y., first prize, $30; Nannie Smit, black and white, bred by Gerrit Smit in North Holland, calved March 22, 1878, imported by exhibitor in 1879.

Smiths & Powell, Syracuse, N. Y., second prize, $15; Ethel, black and white, bred by C. DeBau in North Holland, calved March 26, 1878, imported by exhibitors in 1879.

HEIFERS ONE YEAR OLD.

Gerrit S. Miller, Peterboro, N. Y., first prize, $20; Panacea, black and white, bred by exhibitor, calved April 16, 1879, sire Billy Boelyn 189, dam Pansy, imported from North Holland by exhibitor in 1878.

Smiths & Powell, Syracuse, N. Y., second prize, $10; Netherland Princess, black and white, bred by A. C. Koning, North Holland, calved April 6, 1879, imported by exhibitors.

HEIFER CALVES.

Smiths & Powell, Syracuse, N. Y., first prize, $10; Jannek 2nd, black and white, bred by exhibitors, calved February 28, 1880, sire Wortele (in Holland), dam Jannek, imported by exhibitors from North Holland in 1879, gr. d. Swartkoop.

Gerrit S. Miller, Peterboro, N. Y., second prize, $5; Onyx, black and white, bred by exhibitor, calved March 11, 1880, sired in Holland, dam Ondine, imported from North Holland by exhibitor in 1879.

JERSEYS — JERSEY HERD PRIZE.

Erastus Corning, Albany, N. Y., large gold medal.

Bull, Stockwell 3rd, gray fawn, bred by John C. Godfray, St. Saviour's Jersey, imported by exhibitor, calved September, 1872, sire Stockwell 2nd (24), dam Handsome.

Cow, Lettie Wing, dark gray, bred by Thomas H. Faile, West Farms, N. Y., calved April 28, 1873, sire Mercury 432, dam Winglet, imported by Davis Collamore.

Cow, Maida, deer colour, bred by Thomas H. Faile, West Farms, N. Y., calved May 1, 1875, sire Bismarck 1423, dam Myrita, by Mercury 433, gr. d. Myra by Dolphin 2nd 468.

Cow, Maid of St. Ouen 2nd, gray and black, bred by exhibitor, calved January 11, 1877, sire Stockwell 3rd 2770, dam Maid of St. Ouen, imported by exhibitor.

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Cow, Maid of Kenwood, black with some white, bred by exhibitor, calved August 8, 1877, sire Stockwell 3rd 2770, dam Lady Stockwell by Stockwell 3rd 2770, gr. d. Daisy Mortua, imported by exhibitor.

Heifer, Jersey Lass 2nd, fawn, bred by exhibitor, calved September 4, 1878, sire Stockwell 3rd 2770, dam Jersey Lass, imported by exhibitor.

BULLS OVER THREE YEARS OLD.

Erastus Corning, Albany, N. Y., first prize, $50; Stockwell 3rd, gray fawn, bred by John C. Godfray, St. Saviour's, Jersey, imported by exhibitor, calved September, 1872, sire Stockwell 2nd (24), dam Handsome.

W. L. & W. Rutherford, Waddington, N. Y., second prize, $25; Royal Dane, gray, bred by Moses Ellis, Framingham, Mass., calved June 12, 1877, sire Sweepstakes Duke 1095, dam Lady Dane by Sam Weller 14, gr. d. Princess 2nd by McClellan 323.

BULLS TWO YEARS OLD.

Edward L. Clarkson, Tivoli, N. Y., first prize, $40; Harold, of Jersey, squirrel gray, black points, bred by exhibitor, calved November, 11, 1877, sire Northern Chief (137), dam Belle of St. Ouen, imported by exhibitor.

Erastus Corning, Albany, N. Y., second prize, $20; Kenwood, brown, black points, bred by exhibitor, calved March 15, 1878, sire Stockwell 3rd 2770, dam Maid of St. Ouen, imported by exhibitor.

BULLS ONE YEAR OLD.

Erastus Corning, Albany, N. Y., first prize, $30; Diavolo, brown, black points, bred by exhibitor, calved July 31, 1879, sire Stockwell 3rd 2770, dam Tranquillity by Stockwell 3rd 2770, gr. d. Daisy Mortua, imported by exhibitor.

F. D. Curtis, Charlton, N. Y., second prize, $15; McHenry, gray and black, bred by exhibitor, calved November 14, 1878, sire Lord Charlton, dam Delle by Matchem 747, gr. d. Honesty by Clement 115.

BULL CALVES.

C. R. Agnew, Palisades, N. Y., first prize, $10; Hill Crest, silver fawn, bred by exhibitor, calved March 9, 1880, sire Ash Bud 3317, dam Delightsome by Orpheus 1219, gr. d. Mu by Palisades 803.

Edward L. Clarkson, Tivoli, N. Y., second prize, $5; ———, solid squirrel gray, black points, bred by exhibitor, calved March 30, 1880, sire Index 1743, dam Eveline of Jersey (imported by exhibitor) by Gray Prince (168), gr. d. Daisy.

COWS OVER THREE YEARS OLD.

Erastus Corning, Albany, N. Y., first prize, $40; Maid of St. Ouen 2nd, gray and black, bred by exhibitor, calved January 11, 1877, sire Stockwell 3rd 2770, dam Maid of St. Ouen, imported by exhibitor.

W. L. & W. Rutherford, Waddington, N. Y., second prize, $20; Cad Lee, fawn and white, bred by C. S. Bradley, Providence, R. I., calved August 28, 1876, sire Von Bismarck 2nd 1779, dam Lurlina by King of Fairview 778, gr. d. Frolic 3rd by Rob Roy 17.

HEIFERS TWO YEARS OLD.

C. R. Agnew, Palisades, N. Y., first prize, $30; Amytis, solid fawn, bred by exhibitor, calved March 15, 1878, sire Rockland 2228, dam Edie by Narragansett 536, gr. d. Bessie by Comet 130.

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A. G. Barlow & Co., North Ridgeway, N. Y., second prize, $15; Janaire 2nd, cream fawn and white, bred by W. L. & W. Rutherford, Waddington N. Y., calved April 8, 1878, sire Earl of Brookside 1677, dam Janaire by Billy Norton 2014, gr. d. Clover Bud by Monitor 878.

HEIFERS ONE YEAR OLD.

W. L. & W. Rutherford, Waddington, N. Y., first prize, $20; Cad Lee 2nd, solid fawn, bred by exhibitors, calved October 22, 1878, sire Aurora Borealis 2408, dam Cad Lee by Von Bismarck 2nd 1779, gr. d. Lurlina by King of Fairview 778.

Erastus Corning, Albany, N. Y., second prize, $10; Jersey Lass 2nd, fawn, bred by exhibitor, calved September 4, 1878, sire Stockwell 3rd 2770, dam Jersey Lass, imported by exhibitor.

HEIFER CALVES.

W. L. & W. Rutherford, Waddington, N. Y., first prize, $10; Sunlight, bred by exhibitors, calved March 20, 1880, sire Royal Dane 3254, dam Kosi 5th by Bristol Chief 1496, gr. d. Kosi, imported.

C. R. Agnew, Palisades, N. Y., second prize, $5; Mu 2nd, solid fawn, bred by exhibitor, calved March 13, 1880, sire Ash-Bud 3317, dam Mu by Palisades 808, gr. d. Maggie No. 2 by Suffolk 607.

GUERNSEYS—GUERNSEY HERD PRIZE.

James Lawrence, Groton, Mass., large gold medal.

Bull, Gurth, brindled red and white, bred by exhibitor, calved September, 1876, sire Little John 34, dam Maid of Guernsey, imported in 1874 by the Massachusetts Agricultural Society.

Cow, Maid of Guernsey, lemon fawn and white, bred in Guernsey, calved August, 1870, imported in 1874 by the Massachusetts Agricultural Society.

Cow, Eleanor, dark red fawn and white, bred in Guernsey, calved August, 1871, imported in 1874 by the Massachusetts Agricultural Society.

Cow, Groton Bouncer, lemon fawn and white, bred by Nicholas Heaume, Forest, Guernsey, calved December, 1875, imported by Charles M. Beach, in 1877.

Cow, Cowslip, fawn and white, bred by S. Wyatt in Guernsey, calved January, 1876, imported by exhibitor in 1878.

Cow, Pomona, lemon fawn and white, bred by Le Pierre, Torteval, Guernsey, calved May, 1876, imported by Simon Beattie in 1878.

BULLS OVER THREE YEARS OLD.

R. Hallowell, West Charlton, N. Y., first prize, $50; Sam, fawn and white, bred by exhibitor, calved March 24, 1877, sire Normandy 158, dam Cherry of Hillside 4th by Earl of Guernsey 151, gr. d. Cherry of Hillside, imported.

James Lawrence, Groton, Mass., second prize, $25; Gurth, brindled red and white, bred by exhibitor, calved September 20, 1876, sire Little John 34, dam Maid of Guernsey, imported in 1874 by the Massachusetts Agricultural Society.

BULLS TWO YEARS OLD.

Richard J. Story, Greenbush, N. Y., first prize, $40; Favorite, lemon fawn and and white, bred by Mr. Norman, Guernsey, calved June 30, 1878, sire Barbett's bull, in Guernsey, dam Dandides, imported by S. Beattie.

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John H. Livingston, Tivoli, N. Y., second prize, $20; Powhattan, fawn and white, bred by Herbert Merriam, Weston, Mass., calved August 8, 1878, imported in dam, Semiramis.

BULLS ONE YEAR OLD.

James Lawrence, Groton, Mass., first prize, $30; bred by exhibitor, calved June 29, 1879, sire Little John 34, dam Primrose, imported by exhibitor in 1878.

James Lawrence, Groton, Mass., second prize $15; Robin Hood, lemon red, bred by exhibitor, calved July 29, 1879, sire Gurth 65, dam Groton Bouncer by Pilgrim 14, gr. d. Jessie by Major B, 21.

BULL CALVES.

James Lawrence, Groton, Mass., first prize, $10; bred by exhibitor, calved March 25, 1880, sire Gurth 65, dam Tattle, bred by N. Torode in Guernsey, and imported in 1877.

COWS OVER THREE YEARS OLD.

John H. Livingston, Tivoli, N. Y., first prize, $40; Jacqueline, fawn and white, calved December, 1875, bred by John Cheminant in Guernsey, and imported by C. M. Beach in 1878.

James Lawrence, Groton, Mass., second prize, $20; Eleanor, dark red fawn and white, bred in Guernsey, calved August, 1871, imported in 1874 by the Massachusetts Agricultural Society.

HEIFERS TWO YEARS OLD.

John H. Livingston, Tivoli, N. Y., first prize, $30; Maggy, fawn and white, bred by L. G. B. Cannon, Burlington, Vt., calved June 2, 1878, sired in Guernsey, dam Elsie, imported by James Lawrence.

Charles H. Malleson, Hudson, N. Y., second prize, $15; Pet, fawn, bred by exhibitor, calved September 24, 1877, sire Kosciusco 45, dam Henrietta Thorn by Forest 48, gr. d. Pet's Pet by Samuel Fee's bull 81.

HEIFERS ONE YEAR OLD.

John H. Livingston, Tivoli, N. Y., first prize, $20; Roanoke, reddish fawn and white, bred by Silas Betts, Camden, N. J., calved February 25, 1879, sire Albemarle 56, dam Jennie by Romeo 40, gr. d. Nellie, imported.

Charles H. Malleson, Hudson, N. Y., second prize, $10; Fannie Forest, fawn, bred by exhibitor, calved July, 1879, sire Alexis 59, dam Lady Forest, imported by S. A. Chase.

CATTLE OF ANY KIND — MILCH COWS.

Gerrit S. Miller, Peterboro, N. Y., first prize, $30; Johanna (Holstein), black and white, calved in 1871, bred by K. J. Akkerman in North Holland, imported by exhibitor in 1878.

David Wait, Wells Bridge, N. Y., second prize, $15; Cherry (grade Devon), red, bred by exhibitor, calved April 1, 1878, sire Candy 2nd.

FAT OXEN OVER FOUR YEARS OLD.

George Ayrault, Poughkeepsie, N. Y., first prize, $30; grade shorthorn, roan, five years.

FAT STEERS UNDER FOUR YEARS OLD.

George Ayrault, Poughkeepsie, N. Y., second prize, $15; roan.

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FAT COWS OVER FOUR YEARS OLD.

Erastus Corning, Albany, N. Y., first prize, $30; Edith (Hereford), bred by exhibitor, calved April, 1875, sire Comus, dam Grace by Taurus.

George Ayrault, Poughkeepsie, N. Y., second prize, $15; white, four years.

FAT HEIFERS UNDER FOUR YEARS OLD.

George Ayrault, Poughkeepsie, N. Y., first prize, $30; red and white.

EXTRA AWARDS.

J. A. Pomeroy, Sidney Centre, N. Y., $10; pair of Devon steers, three years old.

Otto Stevel, Spencertown, N. Y., $15; pair twin steers, grade Holstein, extra closely mated and well trained.

Frank B. Redfield, Batavia, N. Y., $40; for his exhibition of Polled Angus or Aberdeen cattle.

Zerah Rider, Cambridge, N. Y., $30; for his exhibition of Swiss cattle.

HORSES.

SPECIAL PRIZE FOR THE BEST DRAUGHT OR AGRICULTURAL STALLION OF ANY AGE OR BREED, $100.

Smiths & Powell, Syracuse, N. Y., special prize, $100; Campsie, bay, 16.2, four years, imported by exhibitors.

CLYDESDALES AND THEIR CROSSES — STALLIONS OVER FOUR YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $50; Campsie, bay, 16.2, four years, imported by exhibitors.

David J. McKnutt, Palmyra, N. Y., second prize, $25; Young Champion, bay, 16.3, seven years, sire imported Champion.

STALLIONS THREE YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $40; Wellington 2nd, bay, sire Bold Buccleugh, dam by Conqueror, gr. d. by Duke of Wellington.

Smiths & Powell, Syracuse, N. Y., second prize, $20; Laird of Fife, bay, imported by exhibitors.

STALLIONS TWO YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $30; Young Conqueror, chestnut, sire Conqueror, dam by Jack's Alive, gr. d. by Waggon-Shaker.

Smiths & Powell, Syracuse, N. Y., second prize, $15; Young Lord Derby, bay, sire Lord Derby, dam Belle by Young Champion, gr. d. Molly by Clyde.

STALLIONS ONE YEAR OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $20; Robert Bruce, sire Scotchman (by Young Campsie), dam Lady Wallace, imported.

George Short, Clifton Springs, N. Y., second prize, $10; Surprise, bay, sire Young Champion.

MARES OVER FOUR YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $50; Middy Morgan, bay, 16 2, seven years, sire Old Netherby, dam Polly by London Tom, gr. d. by Merry Farmer.

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FILLIES THREE YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $40; Lady Haddo, brown, sire Lord Haddo, dam Lady of the Manor by Lord of the Manor, gr. d. Lady Wellington by Duke of Wellington.

FILLIES TWO YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $30; Perfection, brown, sire King of the East, dam Kate by Campsie Jock.

FILLIES ONE YEAR OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $20; Lovely, bay, sire King of the East, dam Fanny by Marquis of Lorne, gr. d. by Old Netherby.

PERCHERONS AND THEIR CROSSES — STALLIONS OVER FOUR YEARS OLD.

Howard G. White, Syracuse, N. Y., first prize, $50; Raspail, gray, 17, five years, bred by P. Sagoy, Nogent-le-Rotrou, France, imported by exhibitor; sire Pierrott, dam Couronne.

John. W. Akin, Scipio, N. Y., second prize, $25; Duke of Homer, dapple gray, 16.3, six years, sire Duke de Charteris, dam by Rollo, gr. d. by Beebe's Percheron.

STALLIONS THREE YEARS OLD.

E. A. Cottrell, Andover, N. Y., first prize, $40; Napier, gray. 15¼, bred by Daniel Dunham, Wayne, Ill. sire Success 452, dam by French Emperor 203, gr d. by Sipe's Sampson.

STALLIONS TWO YEARS OLD.

Charles H. Angel, Ghent, N. Y., first prize, $30; Duke of Perche, Jr., black with star and two white feet, bred by M. W. Dunham, Dupage, Ill.: sire imported Duke of Perche 173, dam by Diamond.

Morgan Ames, Scipio Centre, N. Y., second prize, $15; Prince Albert, gray, 15.3.

MARES OVER FOUR YEARS OLD.

Horace G. White, Syracuse, N. Y., first prize, $50; Chatton, gray, 16, four years, bred by Goupil Eduz, Nogent-le-Rotrou, France, imported by exhibitor; sire Le Cœur Joly, dam Pauline.

John W. Akin, Scipio, N. Y., second prize, $25; Topsy, gray, 16, five years, sire Duke de Charteris, dam by Rollo.

FILLIES THREE YEARS OLD.

Howard G. White, Syracuse, N. Y., first prize, $40; Rustique, gray, 16, bred by H. Guibert, Nogent-le-Rotrou, France, imported by exhibitor; sire Margot, dam Rustique.

THOROUGHBREDS AND THEIR CROSSES — SPECIAL PRIZE FOR THE BEST STALLION OF ANY AGE, $150.

Edwin Thorne, Millbrook, N. Y, special prize, $150; Thorndale, bay, 15¼, 15 years, sire Alexander's Abdallah, dam Dolly by Mambrino Chief, gr. d. by a son of Potomac.

STALLIONS OVER FIVE YEARS OLD.

Edwin Thorn, Millbrook, N. Y., first prize, $70; Thorndale, bay, 15¼, 15 years, sire Alexander's Abdallah, dam Dolly by Mambrino Chief, gr. d. by a son of Potomac.

Erastus Corning, Albany, N. Y., second prize, $35; Vulcan, black, 16.1, 5 years, bred by exhibitor; sire Henry Clay, dam Julia by Long Island Black Hawk.

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STALLIONS FOUR YEARS OLD.

H. M. Littel, Macedon, N. Y., first prize, $60; St. Arnaud, bay, white hind ankles, 15.2, bred by J. C. McFerran & Son, Louisville, Ky.; sire Cuyler, by Rysdyk's Hambletonian, dam Emma Arterburn, by Mambrino Patchen, gr. d. Jennie Johnson by Sweet Owen.

F. A. Shattuck, Cohoes N. Y., second prize, $30; Perfection, dark bay, 15.3, bred by exhibitor; sire Aristos, by Daniel Lambert, dam by Nonpareil.

STALLIONS THREE YEARS OLD.

Erastus Corning, Albany, N. Y., first prize, $50; Shawmut, bay, 15 3, bred by Edward Thorne, Millbrook, N. Y.; sire Henry Clay, dam Heroine by Rysdyk's Hambletonian, gr. d. Lady Patriot by Patriot.

Wolcott Van de Bogart, Batavia, N. Y., second prize, $25; Blue Danube, bay, bred by A. J. Alexander, Woodburn, Ky.; sire Woodford Mambrino, dam Cracovienne by Alexander's Abdallah, gr. d. by Cracker.

STALLIONS TWO YEARS OLD.

Smith & Powell, Syracuse, N. Y., first prize, $40; Sir William, bay, sire Reveller.

S. J. Craver, Defreestville, N. Y., second prize, $20; Young Duke, dark bay, 15, bred by exhibitor; sire Grand Duke, dam by Rattler.

STALLIONS ONE YEAR OLD.

H. M. Littel, Macedon, N. Y., first prize, $30; Thornwood, bay, bred by H. M. Bugher, Glendale, O.; sire Woodlawn, by Hero of Thorndale, dam by Mambrino Clay, gr. d. Susan Loder by Daniel Boone.

Smiths & Powell, Syracuse, N. Y., second prize, 15; Conquest, bay, sire Reveller, dam Lady Bonner by Robert Bonner.

MARES OVER FIVE YEARS OLD.

Dean Sage, Albany, N. Y., first prize, $60; black, 15.3, foaled 1874, bred by M. M. Willson, Troy, N. Y.; sire Antenor, dam Daisy Beach by Young Columbus, gr. d. by Truxton.

Charles W. Little, Albany, N. Y., second prize, $30; Lady May, roan, 15, six years, bred by exhibitor, sire Captain Winfield, dam Lady Jane.

FILLIES FOUR YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $50; Zephyr, bay, sire Reveller, dam Jessie by Rough and Ready, gr. d. Tiptoe by Grinnell's Champion.

Henry M. Littel, Macedon, N. Y., second prize, $25; Belle of Ashland, dark bay, bred by Treacy & Simmons, Ashland Park, Ky.; sire Post's Hambletonian, dam by American Clay, gr. d. by Downing's Bay Messenger.

FILLIES THREE YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $40; May Flower, chestnut, sire Lysander, dam Lady Stark by Consternation.

Samuel Parson, Oxford Depot, N. Y., second prize, $20; Lady Pooler, bay, bred by exhibitor; sire Happy Prince, dam by Alexander's Abdallah, gr. d. by Saltram.

FILLIES TWO YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $30; Nymph, brown, sire Reveller, dam by Cornell's Black Hawk.

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Charles W. Little, Albany, N. Y., second prize, $15; Miss Joy, brown roan, bred by exhibitor; sire Joe Brown, dam Lady Jane.

FILLIES ONE YEAR OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $20; Gazelle, brown, sire Reveller, dam by Satellite, gr. d. by Consternation.

H. M. Littel, Macedon, N. Y., second prize, $10; Rattlebox, chestnut, bred by exhibitor; sire Hermit, by Rysdyk's Hambletonian, dam Saucebox by Mambrino Columbus, gr. d. Forest Maid by Alexander's Edwin Forrest.

HARNESS AND SADDLE HORSES — DRAUGHT PAIRS.

Thomas Clark, Whitesboro, N. Y., first prize, $50; brown, 16, five and six years.

S. J. Craver, Defreestville, N. Y., second prize, $25; dark bay, 16, six and eight years, bred by exhibitor.

COACH PAIRS.

M. J. Slingerland, Albany, N. Y., first prize, $50; bay, 16, eight years.

Seneca Dennis, Melrose, N. Y., second prize, $25; black, 15.3, seven years, sire the Dolan horse.

PHAETON PAIRS.

Mrs. L. Cornell, West Troy, N. Y., first prize, $50; black, eleven and four years, sire American Ethan Allen, dam Lawrence mare from Canada.

J. W. Budd, North Chatham, N. Y., second prize, $25; bays, 15.3, eight years.

ROADSTERS.

Charles W. Little, Albany, N. Y., first prize, $30; Forest Hill Belle, bay, 15¼, seven years, bred by exhibitor, sire Capt. Winfield, dam Lady Jane.

S. B. Bradley, Adamsville, N. Y., second prize, $15; Kingsbury Boy, dark bay, 16.1, six years, sire Humphrey Clinker, dam Flora by American.

SADDLE HORSES.

E. D. Brainard, Albany, N. Y., first prize, $30; black, 15¼, eighteen years.

Thomas Clark, Whitesboro, N. Y., second prize, $15; black.

JACKS AND MULES — JACKS.

Joseph Juliand, Bainbridge, N. Y., first prize, $30; red roan, foaled April 19, 1870, bred in San Antonio, Texas.

Peter H. Rykert, Nassau, N. Y., second prize, $15; black, 13, nine years old, bred by H. Hyzradt, Kinderhook, N. Y., sire Blind Jack, imported from Spain.

PAIRS OF MULES.

Joseph Juliand, Bainbridge, N. Y., first prize, $30; brown, 15 hands.

EXTRA PRIZE.

H. R. C. Watson, West Farms, N. Y., $30 for a good display of Shetland Ponies.

SHEEP, SWINE AND POULTRY.

LONG-WOOLED SHEEP — LEICESTER RAMS ONE YEAR OLD.

W. L. & W. Rutherford, Waddington, N. Y., first prize, $20; imported.

LEICESTER RAM LAMBS.

W. L. & W. Rutherford, Waddington, N. Y., first prize, $10.

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PENS OF (THREE) LEICESTER EWES OVER TWO YEARS OLD.

W. L. & W. Rutherford, Waddington, N. Y., first prize, $20; bred by exhibitors.

PENS OF (THREE) LEICESTER YEARLING EWES.

W. L. & W. Rutherford, Waddington, N. Y., first prize, $20; bred by exhibitors.

PENS OF (THREE) LEICESTER EWE LAMBS.

W. L. &. W. Rutherford, Waddington, N. Y., first prize, $10; bred by exhibitors

COTSWOLD RAMS OVER TWO YEARS OLD.

George Ingersoll, Charleston, N. Y., first prize, $20.

Robert Wemple, Fultonville, N. Y., second prize, $10; bred by Mr. Walker, in England.

COTSWALD RAMS, ONE YEAR OLD.

George Ingersoll, Charleston, N. Y., first prize, $20.

George Ingersoll, Charleston, N. Y., second prize, $10.

COTSWOLD RAM LAMBS.

George Ingersoll, Charleston, N. Y., first prize, $10.

George Ingersoll, Charleston, N. Y., second prize, $5.

PENS OF (THREE) COTSWOLD EWES OVER TWO YEARS OLD.

George Ingersoll, Charleston, N. Y., first prize, $20.

George Ingersoll, Charleston, N. Y., second prize, $10.

PENS OF (THREE) COTSWOLD YEARLING EWES.

George Ingersoll, Charleston, N. Y., first prize, $20.

Robert Wemple, Fultonville, N. Y., second prize, $10.

PENS OF (THREE) COTSWOLD EWE LAMBS.

George Ingersoll, Charleston, N. Y., first prize, $10.

C. W. Canfield, Athens, Pa., second prize, $5; bred by exhibitor.

LINCOLN RAMS OVER TWO YEARS OLD.

Johnson & Smith, Geneva, N. Y., first prize, $20.

LINCOLN RAMS ONE YEAR OLD.

Johnson & Smith, Geneva, N. Y., first prize, $20.

PENS OF (THREE) LINCOLN EWES OVER TWO YEARS OLD.

Johnson & Smith, Geneva, N. Y., first prize, $20.

PENS OF (THREE) LINCOLN EWES ONE YEAR OLD.

Johnson & Smith, Geneva, N. Y., first prize, $20.

PENS OF (THREE) LINCOLN EWE LAMBS.

Johnson & Smith, Geneva, N. Y., first prize, $10.

MIDDLE-WOOLED SHEEP — SOUTHDOWN RAMS OVER TWO YEARS OLD.

John Hobart Warren, Hoosick Falls, N. Y., first prize, $20; bred by John D. Wing, Millbrook, N. Y.

John Hobart Warren, Hoosick Falls, N. Y., second prize, $10; bred by S. J. Sharpless, Philadelphia, Penn.

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SOUTHDOWN RAMS ONE YEAR OLD.

Daniel B. Haight, Dover Plains, N. Y., first prize, $20; bred by Lord Walsingham.
Daniel B. Haight, Dover Plains, N. Y., second prize, $10; bred by exhibitor.

SOUTHDOWN RAM LAMBS.

Daniel B. Haight, Dover Plains, N. Y., first prize, $20.
John Hobart Warren, Hoosick Falls, N. Y., second prize, $10.

PENS OF (THREE) SOUTHDOWN EWES OVER TWO YEARS OLD.

Daniel B. Haight, Dover Plains, N. Y., first prize, $20; two years, bred by exhibitor.
Daniel B. Haight, Dover Plains, N. Y., second prize, $10; two years, bred by exhibitor.

PENS OF (THREE) SOUTHDOWN EWES ONE YEAR OLD.

Daniel B. Haight, Dover Plains, N. Y., first prize, $20; bred by exhibitor.
John Hobart Warren, Hoosick Falls, N. Y., second prize, $10; bred by exhibitor.

PENS OF (THREE) SOUTHDOWN EWE LAMBS.

John Hobart Warren, Hoosick Falls, N. Y., first prize, $10.
Daniel B. Haight, Dover Plains, N. Y., second prize, $5; bred by exhibitor.

SHROPSHIRE RAMS OVER TWO YEARS OLD.

Charles D. Sickler, Malta, N. Y., first prize, $20; Monarch, four years, imported by Samuel Eddy, Canada.
Berosus Cook, Otego, N. Y., second prize, $10; imported.

SHROPSHIRE RAMS ONE YEAR OLD.

Berosus Cook, Otego, N. Y., first prize, $20; bred by L. C. Fish, Otego, N. Y.
L. C. Fish, Otego, N. Y., second prize, $10; bred by exhibitor.

SHROPSHIRE RAM LAMBS.

L. C. Fish, Otego, N. Y., first prize, $10; bred by exhibitor.
E. B. Hawks, Wells Bridge, N. Y., second prize, $5.

PENS OF (THREE) SHROPSHIRE EWES OVER TWO YEARS OLD.

Charles D. Sickler, Malta, N. Y., first prize, $20.
Berosus Cook, Otego, N. Y., second prize, $10; bred by L. C. Fish, Otego, N. Y.

PENS OF (THREE) SHROPSHIRE EWES ONE YEAR OLD.

Berosus Cook, Otego, N. Y., first prize, $20; bred by L. C. Fish, Otego, N. Y.
L. C. Fish, Otego, N. Y., second prize, $10; bred by exhibitor.

PENS OF THREE SHROPSHIRE EWE LAMBS.

Charles D. Sickler, Malta, N. Y., first prize, $10.
E. B. Hawks, Wells Bridge, N. Y., second prize, $5.

HAMPSHIRE RAMS OVER TWO YEARS OLD.

Eugene Ham, Verbank, N. Y., first prize, $20; bred by L. K. Kline.

HAMPSHIRE RAMS ONE YEAR OLD.

Eugene Ham, Verbank, N. Y., first prize, $20; bred by T. Chapman Saunders, England.

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HAMPSHIRE RAM LAMBS.

Eugene Ham, Verbank, N. Y., first prize, $10.
Eugene Ham, Verbank, N. Y., second prize, $5.

PENS OF (THREE) HAMPSHIRE EWES OVER TWO YEARS OLD.

Eugene Ham, Verbank, N. Y., first prize, $20.

PENS OF (THREE) HAMPSHIRE EWES ONE YEAR OLD.

Eugene Ham, Verbank, N. Y., first prize, $20; bred by T. C. Saunders, England
Eugene Ham, Verbank, N. Y., second prize, $10; bred by exhibitor.

PENS OF (THREE) HAMPSHIRE EWE LAMBS.

Eugene Ham, Verbank, N. Y., first prize, $10; bred by exhibitor.

FINE-WOOLED SHEEP, MERINOS BRED FOR FINENESS OF WOOL — RAMS OVER TWO YEARS OLD.

Carl Heyne, Red Hook, N. Y., first prize, $20.
Carl Heyne, Red Hook, N. Y., second prize, $10.

RAMS ONE YEAR OLD.

Carl Heyne, Red Hook, N. Y., first prize, $20.
E. Townsend, Pavilion Centre, N. Y., second prize, $10.

RAM LAMBS.

Carl Heyne, Red Hook, N. Y., first prize, $10.
Carl Heyne, Red Hook, N. Y., second prize, $5.

PENS OF (THREE) EWES OVER THREE YEARS OLD.

Carl Heyne. Red Hook, N. Y., first prize, $20.
Carl Heyne, Red Hook, N. Y., second prize, $10.

PENS OF (THREE) EWES TWO YEARS OLD OR UNDER.

Carl Heyne, Red Hook, N. Y., first prize, $20.
Carl Heyne, Red Hook, N. Y., second prize, $10.

PENS OF (THREE) EWE LAMBS.

Carl Heyne, Red Hook, N. Y., first prize, $10.
Carl Heyne, Red Hook, N. Y., second prize, $5.

MERINOS BRED FOR WEIGHT OF FLEECE — RAMS OVER THREE YEARS OLD.

S. B. Lusk, Batavia, N. Y., first prize, $20.
Joel W. Hardy, East Palmyra, N. Y., second prize, $10.

RAMS TWO YEARS OLD.

Sylvester B. James, Hoosick, N. Y., first prize, $20; bred by exhibitor.
E. Townsend, Pavilion Centre, N. Y., second prize, $10.

RAMS ONE YEAR OLD.

G. W. Ostrander & Son, Hoosick Falls, N. Y., first prize, $20.
E. Townsend, Pavilion Centre, N. Y., second prize, $10.

RAM LAMBS.

Joseph H. Brown, Hoosick, N. Y., first prize, $10.
E. Townsend, Pavilion Centre, N. Y., second prize, $5.

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PENS OF (THREE) EWES OVER THREE YEARS OLD.

S. B. Lusk, Batavia, N. Y., first prize, $20.
E. Townsend, Pavilion Centre, N. Y., second prize, $10.

PENS OF (THREE) EWES TWO YEARS OLD OR UNDER.

E. Townsend, Pavilion Centre, N. Y., first prize, $20.
S. B. Lusk, Batavia, N. Y., second prize, $10.

PENS OF (THREE) EWES ONE YEAR OLD.

E. Townsend, Pavilion Centre, N. Y., first prize, $20.
Joel W. Hardy, East Palmyra, N. Y., second prize, $10.

PENS OF (THREE) EWE LAMBS.

E. Townsend, Pavilion Centre, N. Y., first prize, $10.
G. W. Ostrander & Son, Hoosick Falls, N. Y., second prize, $5.

MERINOS BRED FOR LENGTH OF STAPLE — RAMS OVER TWO YEARS OLD.

Joel W. Hardy, East Palmyra, N. Y., first prize, $20.
S. B. James, Hoosick, N. Y., second prize $10.

RAMS ONE YEAR OLD.

S. B. Lusk, Batavia, N. Y., first prize, $20.
G. W. Ostrander & Son, Hoosick, N. Y., second prize, $10.

RAM LAMBS.

E. Townsend, Pavilion Centre, N. Y., first prize, $10.
J. O. Joslin, Tiashoke, N. Y., second prize, $5.

PENS OF (THREE) EWES OVER THREE YEARS OLD.

E. Townsend, Pavilion Centre, N. Y., first prize, $20.
S. B. Lusk, Batavia, N. Y., second prize, $10.

PENS OF (THREE) EWES TWO YEARS OLD OR UNDER.

Pierce & Fellows, Spencerport, N. Y., first prize, $20.
S. B. Lusk, Batavia, N. Y., second prize, $10.

PENS OF (THREE) EWE LAMBS.

E. Townsend, Pavilion Centre, N. Y., first prize, $10.
Joel W. Hardy, East Palmyra, N. Y., second prize, $5.

SWINE.

LARGE WHITE BREED — BOARS OVER ONE YEAR OLD.

E. W. Davis, Oneida, N. Y., first prize, $20; Jupiter, 2nd, 1 year 6 months.
F. D. Curtis, Charlton, N. Y., second prize; $10; Prince of Wales (Victoria).

BOARS UNDER ONE YEAR OLD.

E. W. Davis, Oneida, N. Y., first prize, $20; Roderick Dhu, 4½ months.
E. W. Davis, Oneida, N. Y., second prize, $10; Dante, 9 months.

SOWS OVER ONE YEAR OLD.

E. W. Davis, Oneida, N. Y., first prize, $20; Maid of Athens, one year.
E. W. Davis, Oneida, N. Y., second prize, $10; Eve, 3 years 6 months.

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SOWS UNDER ONE YEAR OLD.

E. W. Davis, Oneida, N. Y., first prize, $20; Nellie, 6½ months.
E. W. Davis, Oneida, N. Y., second prize, $10; Belle, 6½ months.

POLAND CHINA — BOARS OVER ONE YEAR OLD.

G. H. Bell, Rome, N. Y., first prize, $20; 18 months, bred by D. M. Magie & Co.

BOARS UNDER ONE YEAR OLD.

G. H. Bell, Rome, N. Y., first prize, $20; Roman Boy, 4 months, bred by exhibitor.
Joel W. Hardy, East Palmyra, N. Y., second prize, $10; bred by exhibitor from Magie stock.

SOWS OVER ONE YEAR OLD.

G. H. Bell, Rome, N. Y., first prize, $20; Violet, 2 years 4 months, bred by B. F Tracy, Owego, N. Y.
G. H. Bell, Rome, N. Y., second prize, $10; Minnie, 16 months, bred by exhibitor.

SOWS UNDER ONE YEAR OLD.

G. H. Bell, Rome, N. Y., first prize, $20; Bell's Favorite, 4 months, bred by exhibitor.
G. H. Bell, Rome, N. Y., second prize, $10; Lowell Girl, 4 months, bred by exhibitor.

DUROC OR RED — BOARS OVER ONE YEAR OLD.

A. T. Hoag, Tomhannock, N. Y., first prize, $20; bred by W. H. Holmes' Sons.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $10.

BOARS UNDER ONE YEAR OLD.

F. D. Curtis, Charlton, N. Y., first prize, $20.
A. T. Hoag, Tomhannock, N. Y., second prize, $10; bred by exhibitor.

SOWS OVER ONE YEAR OLD.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $20.
F. D. Curtis, Charlton, N. Y., second prize, $10; Cleopatra.

SOWS UNDER ONE YEAR OLD.

A. T. Hoag, Tomhannock, N. Y., first prize, $20; bred by exhibitor.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $10.

SMALL WHITE BREED — BOARS OVER ONE YEAR OLD.

T. R. Proctor, Utica, N. Y., first prize, $20; Rinaldo, bred by R. M. Hoe, N. Y., 2 years, sire Romeo, dam Snow Drop, 3rd by imported King John.
Ensign & Co., Jeddo, N. Y., second prize, $10; Duke, bred by W. H. Cole, Clinton, N. J., sire Duke of Yorkshire, dam Princess 2nd.

BOARS UNDER ONE YEAR OLD.

T. R. Proctor, Utica, N. Y., first prize, $20; Lord John, bred by H. H. Ingersoll, Owego, N. Y., 11 months, sire Crown Prince, dam Princess 4th.
Ensign & Co., Jeddo, N. Y., second prize, $10; Sam, bred by exhibitors, farrowed January 13, 1880, sire King William, dam Louise.

SOWS OVER ONE YEAR OLD.

T. R. Proctor, Utica, N. Y., first prize, $20; Marchioness A., bred by H. W. Cole, Clinton, N. Y., 2 years, 4 months, sire imported King John, dam imported Flora.

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T. R. Proctor, Utica, N. Y., second prize, $10; Queen IV, bred by H. H. Ingersoll, Owego, N. Y., 2 years, sire King John 3rd, dam Queen.

SOWS UNDER ONE YEAR OLD.

Ensign & Co., Jeddo, N. Y., first prize, $20; Louisa 1st, bred by exhibitors, farrowed January 13, 1880, sire King William, dam Louise.

Ensign & Co., Jeddo, N. Y., second prize, $10; Louise 3rd, bred by exhibitors, farrowed January 13, 1880, sire King William, dam Louise.

BERKSHIRES — BOARS OVER ONE YEAR OLD.

Harper W. Dewey, Sidney Centre, N. Y., first prize, $20; Baron Hood, bred by W. C. Norton, Aldenville, Penn., farrowed April 2, 1879.

Oscar Larison, Lawrenceville, Penn., second prize, $10; Prince, 2 years, bred by A. G. Barlow & Co., sire imported Hillside Prince, dam Empress Lady.

BOARS UNDER ONE YEAR OLD.

Harper W. Dewey, Sidney Centre, N. Y., first prize, $20; Delaware, bred by exhibitor, farrowed March 2, 1880, sire Baron Hood, dam Maid of Orleans.

Oscar Larison, Lawrenceville, Penn., second prize, $10; Prince of Caton, 4 months, bred by exhibitor, sire Prince, dam Lady Star.

SOWS OVER ONE YEAR OLD.

T. R. Proctor, Utica, N. Y., first prize, $20; Sallie Gloucester 5th, bred by Oneida Community, Oneida, N. Y., 1 year 11 months, sire Proctor's Othello, dam Sallie Gloucester.

T. R. Proctor, Utica, N. Y., second prize, $10; Sallie Gloucester, bred by Oneida Community, Oneida, N. Y., 3½ years, sire Emperor of Morocco, dam Favoritina.

SOWS UNDER ONE YEAR OLD.

Harper W. Dewey, Sidney Centre, N. Y., first prize, $20; Maid of Orleans 2nd, bred by exhibitor, farrowed March 2, 1880, sire Baron Hood, dam Maid of Orleans.

Oscar Larison, Lawrenceville, Penn., second prize, $10; Caton Queen, 4 months, bred by exhibitor, sire Prince, dam Lady Star.

ESSEX — BOARS OVER ONE YEAR OLD.

C. W. Canfield, Athens, Penn., first prize, $20; three years, bred by Joseph Harris.

C W. Canfield, Athens, Penn., second prize, $10; two years, bred by Joseph Harris

BOARS UNDER ONE YEAR OLD

J. S. Woodward, Lockport, N. Y., first prize, $20.

C. W. Canfield, Athens, Penn., second prize, $10; bred by exhibitor.

SOWS OVER ONE YEAR OLD.

J. S. Woodward, Lockport, N. Y., first prize, $20.

J. S. Woodward, Lockport, N. Y., second prize, $10.

SOWS UNDER ONE YEAR OLD.

J. S. Woodward, Lockport, N. Y., first prize, $20.

C. W. Canfield, Athens, Penn., second prize, $10; bred by exhibitor.

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POULTRY.

LIGHT BRAHMAS.*

Henry B. Thomas, Troy, N. Y., first prize, $5.
James R. Draper, Troy, N. Y., second prize, $3.

DARK BRAHMAS.

B. W. Baum & Son, Syracuse, N. Y., second prize, $3.

BUFF, LEMON OR CINNAMON COCHINS.

S. Hartwell, Washington, Conn., first prize, $5.
S. Hartwell, Washington, Conn., second prize, $3.

PARTRIDGE OR GROUSE COCHINS.

S. Hartwell, Washington, Conn., first prize, $5.
S. Hartwell, Washington, Conn., second prize, $3.

WHITE COCHINS.

Wm. H. Seeger, Colliers, N. Y., first prize, $5.
O. Howland & Son, Auburn, N. Y., second prize, $3.

BLACK COCHINS.

Robert Lewis, Castleton, N. Y., first prize, $5.
J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

COLORED DORKINGS.

J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

SILVER GRAY DORKINGS.

J. M. Seymour, Clark's Mills, N. Y., first prize, $5.
C. W. Canfield, Athens, Penn., second prize, $3.

DOMINIQUES.

Jones Wilcox, East Chatham, N. Y., first prize, $5.
Jones Wilcox, East Chatham, N. Y., second prize, $3.

PLYMOUTH ROCKS.

Henry B. Thomas, Troy, N. Y., first prize, $5.
Henry B. Thomas, Troy, N. Y., second prize, $3.

GOLDEN-SPANGLED HAMBURGHS.

Newton Adams, Utica, N. Y., first prize, $5.
O. Howland & Son, Auburn, N. Y., second prize, $3.

SILVER-SPANGLED HAMBURGHS.

Jones Wilcox, East Chatham, N. Y., first prize, $5.
Newton Adams, Utica, N. Y., second prize, $3.

GOLDEN-PENCILED HAMBURGHS.

Jones T. Walker, Troy, N. Y., first prize, $5.
E. C. Wendell, Albany, N. Y., second prize, $3.

* All fowls are shown in pairs.

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SILVER-PENCILED HAMBURGHS.

O. Howland & Son, Auburn, N. Y., first prize, $5.
B. W. Baum & Son, Syracuse, N. Y., second prize, $3.

BLACK HAMBURGHS.

Jones Wilcox, East Chatham, N. Y., first prize, $5.
B. W. Baum & Son, Syracuse, N. Y., second prize, $3.

BLACK SPANISH.

O. Howland & Son, Auburn, N. Y., first prize, $5.
E. C. Wendell, Albany, N. Y., second prize, $3.

WHITE LEGHORNS.

Newton Adams, Utica, N. Y., first prize, $5.
Philip Schuyler, West Troy, N. Y., second prize, $3.

BROWN LEGHORNS.

C. W. Canfield, Athens, Penn , first prize, $5.
W. H. Seward, Albany, N. Y., second prize, $3.

DOMINIQUE LEGHORNS.

Jones Wilcox, East Chatham, N. Y., second prize, $3.

CREVE CŒURS.

J. M. Seymour, Clark's Mills, N. Y., first prize, $5.
J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

HOUDANS.

John McHarg, Albany, N. Y., first prize, $5.
B. W. Baum & Son, Syracuse, N. Y., second prize, $3.

LA FLECHE.

O. Howland & Son, Auburn, N. Y., first prize, $5.

GOLDEN POLISH.

O. Howland & Son, Auburn, N. Y., second prize, $3.

SILVER POLISH.

O. Howland & Son, Auburn, N. Y., first prize, $5.

BLACK-BREASTED RED GAMES.

Thomas H. Smith, Hudson, N. Y., first prize, $5.
Thomas H. Smith, Hudson, N. Y., second prize, $3.

BROWN-BREASTED RED GAMES.

Thomas H. Smith, Hudson, N. Y., first prize, $5.
M. E. Williams, Chatham Village, N. Y., second prize, $3.

YELLOW DUCKWING GAMES.

F. W. Gaylor, Nassau, N. Y., second prize, $3.

RED PILE GAMES.

B. W. Baum & Son, Syracuse, N. Y., first prize, $5.

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WHITE PILE GAMES.

O. Howland & Son, Auburn, N. Y., second prize, $3.

BLACK-BREASTED RED GAME BANTAMS.

C. W. Canfield, Athens, Penn., first prize, $5.
B. W. Baum & Son, Syracuse, N. Y., second prize, 3.

BROWN-BREASTED RED GAME BANTAMS.

C. H. Boynton, Hoosick Falls, N. Y., second prize, $3.

RED PILE GAME BANTAMS.

C. H. Boynton, Hoosick Falls, N. Y., first prize, $5.
Fred. Webber, Syracuse, N. Y., second prize, $3.

WHITE PILE GAME BANTAMS.

Fred. Webber, Syracuse, N. Y., second prize, $3.

SILVER DUCKWING GAME BANTAMS.

B. W. Baum & Son, Syracuse, N. Y., first prize, $5.
C. H. Boynton, Hoosick Falls, N. Y., second prize, $3.

YELLOW DUCKWING GAME BANTAMS.

F. W. Gaylor, Nassau, N. Y., first prize, $5.
C. H. Boynton, Hoosick Falls, N. Y., second prize, $3.

SILVER-LACED SEBRIGHT BANTAMS.

B. W. Baum & Son, Syracuse, N. Y., first prize, $5.
B. W. Baum & Son, Syracuse, N. Y., second prize, $3.

GOLD-LACED SEBRIGHT BANTAMS.

J. R. Draper, Troy, N. Y., first prize, $5.
Fred. Webber, Syracuse, N. Y., second prize, $3.

BLACK-LACED SEBRIGHT BANTAMS.

J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

BRONZE TURKEYS.

Wm. H. Seeger, Colliers, N. Y., first prize, $5.
P. H. Vanderzee, South Bethlehem, N. Y., second prize, $3.

WHITE TURKEYS.

Jones Wilcox, East Chatham, N. Y., first prize, $5.
Wm. H. Seeger, Colliers, N. Y., second prize, $3.

PEARL GUINEA FOWLS.

O. Howland & Son, Auburn, N. Y., first prize, $3.
J. M. Houghtaling, Adamsville, N. Y., second prize, $2.

WHITE GUINEA FOWLS.

O. Howland & Son, Auburn, N. Y., first prize, $3.
Joseph Juliand, Bainbridge, N. Y., second prize, $2.

COMMON PEA FOWLS.

Joseph Juliand, Bainbridge, N. Y. first prize, $3.

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TOULOUSE GEESE.

W. H. Seeger, Colliers, N. Y., second prize, $3.

EMBDEN GEESE.

O. Howland &. Son, Auburn, N. Y., first prize, $5.
W. H. Seeger, Colliers, N. Y., second prize, $3.

WHITE CHINA GEESE.

W. H. Seeger, Colliers, N. Y., first prize, $5.
O. Howland & Son, Auburn, N. Y., second prize, $3.

BROWN CHINA GEESE.

W. H. Seeger, Colliers, N. Y., first prize, $5.
O. Howland & Son, Auburn, N. Y., second prize, $3.

WILD GEESE.

O. Howland & Son, Auburn, N. Y., second prize, $3.

ROUEN DUCKS.

J. M. Seymour, Clark's Mills, N. Y., first prize, $5.
O. Howland & Son, Auburn, N. Y., second prize, $3.

AYLESBURY DUCKS.

J M. Seymour, Clark's Mills, N. Y., second prize, $3.

CAYUGA DUCKS.

O. Howland & Son, Auburn, N. Y., first prize, $5.
O. Howland & Son, Auburn, N. Y., second prize, $3.

MUSCOVY DUCKS.

Fred S. Blessing, Slingerlands, N. Y., first prize, $5.
Fred S. Blessing, Slingerlands, N. Y., second prize, $3.

PEKIN DUCKS.

David McKnutt, Palmyra, N. Y., first prize, $5.
Jones Wilcox, East Chatham, N. Y., second prize, $3.

PIGEONS — PAIRS OF POUTERS.

Mathias Cook, Utica, N. Y., first prize, $3; red pied.
S. C. Long, Jr., & Co., New York, N. Y., second prize, $2.

PAIRS OF CARRIERS.

Mathias Cook, Utica, N. Y., first first prize, $3.
J. C. Long, Jr., & Co., New York, N. Y., second prize, $2.

PAIRS OF TUMBLERS.

J. C. Long, Jr., & Co., New York, N. Y., first prize, $3.
Mathias Cook, Utica, N. Y., second prize, $2.

PAIRS OF BARBS.

Mathias Cook, Utica, N. Y., first prize, $3; white.
J. C. Long, Jr., & Co., New York, N. Y., second prize, $2.

PAIRS OF TURBITS (SOLID COLOUR).

J. C. Long, Jr., & Co., New York, N. Y., first prize, $3.

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PAIRS OF TURBITS (WINGED).

J. C. Long, Jr., & Co, New York, N. Y., first prize, $3.
Mathias Cook, Utica, N. Y., second prize, $2.

PAIRS OF OWLS (SOLID COLOUR).

Robert Lewis, Castleton, N. Y., first prize, $3.
J. C. Long, Jr., & Co., New York, N. Y., second prize, $2.

PAIRS OF SHAKING FANTAILS.

J. C. Long, Jr., & Co., New York, N. Y., first prize, $3.
C. W. Canfield, Athens, Penn., second prize, $2.

PAIRS OF JACOBINS.

J. C. Long, Jr., & Co., New York, N. Y., first prize, $3.
Mathias Cook, Utica, N. Y., second prize, $3

PAIRS OF BLUE ROCKS.

Mathias Cook, Utica, N. Y., first prize, $3.
Mathias Cook, Utica, N. Y., second prize, $2.

PAIRS OF DRAGOONS.

Mathias Cook, Utica, N. Y., first prize, $3.

PAIRS OF ANTWERPS.

Mathias Cook, Utica, N. Y., first prize, $3.
J. C. Long, Jr., & Co., New York, N. Y., second prize, $2.

COLLECTIONS OF POUTERS.

J. C. Long, Jr., & Co., New York, N. Y., first prize, $5.
Mathias Cook, Utica, N. Y., second prize, $3.

COLLECTIONS OF CARRIERS.

J. C. Long, Jr., & Co., New York, N. Y., first prize, $5.

COLLECTIONS OF TUMBLERS.

Mathias Cook, Utica, N. Y., first prize, $5.
Joseph Juliand, Bainbridge, N. Y., second prize, $3.

COLLECTIONS OF FANCY PIGEONS.

Mathias Cook, Utica, N. Y., first prize, $5.
J. C. Long, Jr., & Co., New York, N. Y., second prize, $3.

COLLECTIONS OF TOY PIGEONS.

J. C. Long, Jr., & Co., New York, N. Y., first prize, $5.
Mathias Cook, Utica, N. Y., second prize, $3.

LOP-EARED OR MADAGASCAR RABBITS — DOES OF ANY COLOUR.

E. C. Wendell, Albany, N. Y., first prize, $3.

SELF-COLOURED DOES.

E. C. Wendell, Albany, N. Y., first prize, $3.

BROKEN COLOURED BUCKS.

E. C. Wendell, Albany, N. Y., first prize, $3.

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COMMON RABBITS — DOES.

C. W. Canfield, Athens, Penn., first prize, $2.

C. W. Canfield, Athens, Penn., second prize, $1.

IMPLEMENTS AND MACHINES.

Ames Plow Co., Boston, Mass., certificate of merit; Knox's new sulky right and left plough.

O. H. P Cornell, Albany, N. Y., certificate of highest merit; LaDow's Champion, two-horse, half-disc harrow.

J. W. Mann, Brockville, Canada, certificate of merit; broadcast grain, grass-seed and fertilizer sower on horse-rake.

Lyman Norton, Hartford, N. Y., certificate of merit; Norton's flexible and detachable one and two-horse harrows combined.

W. R. Skeels, Watertown, N. Y., certificate of merit; torsion spring-tooth harrow,

W. A. Sproul, Houlton, Me., certificate of merit; Richardson's Champion broadcast seed sower.

Syracuse Chilled Plough Co., Syracuse, N. Y., certificate of highest merit; steel beam and steel and iron chilled mould-board for plough.

Wheeler & Melick Co, Albany, N. Y., certificate of highest merit; LaDow steel spring-tooth harrow.

O. H. P. Cornell, Albany, N. Y., certificate of highest merit; LaDow's Eclipse horse dump, sulky hay-rake.

J. A. Cross, Fultonville, N. Y., certificate of highest merit; hay conveyor.

J. A. Cross, Fultonville, N. Y., certificate of merit; post and other pulleys.

William M. Singerly, Norristown, Penn., certificate of highest merit; gleaner and binder.

Wheeler & Melick Co., Albany, N. Y., certificate of highest merit; the Aspinwall potato digger.

Boomer & Boschert Press Co., Syracuse, N. Y., certificate of highest merit; apple grater.

L. W. Farmer, Boston, Mass., certificate of highest merit; Eaton's patent pea and bean sheller.

D. W. Seeley, Albany, N. Y., certificate of highest merit; Buckman & Seeley's patent hay and cotton press.

S. B. Van Duzer & Co., Gouverneur, N. Y., certificate of highest merit; Bonanza fanning mill.

Mayhew & Slee, Poughkeepsie, N. Y., certificate of highest merit; Mayhew's steam churn motor.

David J. H. Davis, Utica, N. Y., certificate of highest merit; the Howell steam washer.

John E. White, Syracuse, N. Y., certificate of highest merit; clothes-drying machine, with cover for out-door use.

American Lubricator Co., Detroit, Mich., certificate of merit; lubricator for steam engine.

H. H. Babcock, Watertown, N. Y., certificate of merit; wind-mill.

H. Brewer & Co., Lansing, Mich., certificate of highest merit; horizontal tile and brick machine.

E. Caswell, Lyons, N. Y., certificate of highest merit; E. Caswell's Eureka hub-borer and box-setter.

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John Davis, Albany, N. Y., certificate of highest merit; Blind stile boring machine for house blinds.

John Davis, Albany, N. Y., certificate of highest merit; blind slat planer.

Daniel Doncaster, Jr., Albany, N. Y., certificate of merit; clap-board saw.

Daniel Doncaster, Jr., Albany, N. Y., certificate of merit; panel planing machine.

Daniel Doncaster, Jr., Albany, N. Y., certificate of merit; double slat planing machine.

George Gage, Waterford, N. Y., certificate of merit; swing lathe.

Henry C. Haskell's Son, Albany, N. Y., certificate of merit; rotary water motor.

Pearl C. Lewis, Catskill, N. Y., certificate of merit; Lewis' combination force pump.

Mast, Foos & Co., Springfield, O., certificate of highest merit; Buckeye force pump

Mast, Foos & Co., Springfield, O., certificate of highest merit; iron turbine wind engine.

S. C. Midlam, Albany, N. Y., certificate of merit; steam pumps.

Pierce Well Excavator Co., New York, N. Y., certificate of highest merit; artesian well drilling and mineral prospecting machinery.

Washbburn & Moen Manufacturing Co., Worcester, Mass., certificate of highest merit; flat metal ribbon for fencing.

CARRIAGES, ETC.

H. C. Becker, West Troy, N. Y.; certificate of highest merit; Brewster spring waggon.

Simon Cunliffe, Albany, N. Y., certificate of merit; carriage springs.

D. Foley, Bridgeport, Conn., certificate of merit; whiffletrees.

O. S. Gorton, North Brookfield, N. Y., certificate of merit; family waggon, with Gorton's patent springs, reach and seat-fastener.

Hughson's Waggon Co., Syracuse, N. Y., certificate of highest merit; phaeton.

John Kingsbury, Albany, N. Y., certificate of merit; landau sleigh.

T. Larouche, Williamstown, N. Y., certificate of merit; shaft coupling.

P. H. Shaw, Albany, N. Y., certificate of highest merit; two-seated waggon.

P. H. Shaw, Albany, N. Y., certificate of highest merit; jump seat waggon.

P. H. Shaw, Albany, N. Y., certificate of highest merit; side-bar top waggon.

P. H. Shaw, Albany, N. Y., certificate of highest merit; Corning top waggon.

P. H. Shaw, Albany, N. Y., certificate of highest merit; skeleton waggon.

P. H. Shaw, Albany, N. Y., certificate of highest merit; sulky.

P. H. Shaw, Albany, N. Y., certificate of highest merit; six passenger barouche sleigh.

P. H. Shaw, Albany, N. Y., certificate of highest merit; four passenger jump seat sleigh.

P. H. Shaw, Albany, N. Y., certificate of highest merit; four passenger Surrey sleigh.

P. H. Shaw, Albany, N. Y., certificate of highest merit; skeleton sleigh.

Short & Smith, Syracuse, N. Y., certificate of merit; seat-fastener.

Short & Smith, Syracuse, N. Y., certificate of highest merit; three spring wagon.

MISCELLANEOUS.

Charles Gorton, Albany, N. Y., certificate of highest merit; Gorton's stock feed steamer and water heater.

White & Haskell, Albany, N. Y., certificate of merit; ash-sifter.

Albany Saw Works, Albany, N. Y., certificate of merit; exhibition of saws and files.

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American Dairy Salt Co., and Onondaga Coarse Salt Association, Syracuse, N. Y., certificate of highest merit; samples of coarse salt, fine boiled salt and refined table salt, from the Onondaga salt springs.

Autophone Manufacturing Co., Ithaca, N. Y., certificate of merit; autophone.

E. W. Boughton & Co., Troy, N. Y., certificate of highest merit; exhibition of furs and hats.

S. D. Brower & Son, Albany, N. Y., certificate of highest merit; exhibition of silver ware.

Campbell Brothers, Albany, N. Y., certificate of merit; patent galvanized chimney tops.

The Covert Manufacturing Co., West Troy, N. Y., certificate of highest merit; the Covert harness snaps, halters and ties, martingale and breast-chains, etc.

John S. Dickerman, Albany, N. Y., certificate of highest merit; hammock reclining rocking chair.

William Doyle, Albany, N. Y., certificate of highest merit; artistic casting in iron.

Thomas Elkins, Albany, N. Y., certificate of highest merit; Elkins' patent refrigerator.

L. A. Garratt, West Troy, N. Y., certificate of highest merit; premium dinner pail.

William R. Hanrahan, Albany, N. Y., certificate of merit; John R. Purdy & Co.'s metallic spring mattress.

George Jackson, Albany, N. Y., certificate of merit; drain tiles.

Kendall Manufacturing Co., Providence, R. I., certificate of merit; soapine.

E. J. Larabee & Co., Albany, N. Y., certificate of highest merit; biscuits, etc.

Lee & Dunscomb, Albany, N. Y., certificate of highest merit; marbleized slate mantels, etc.

Mrs. John McDuffie, Albany, N. Y., certificate of highest merit; exhibition of dyed and cleaned textile fabrics.

Willard E. Masten, Albany, N. Y., certificate of merit; Capital City Florida water.

Meyrowitz Brothers, Albany, N. Y., certificate of merit; optical instruments.

William F. Moulton, Jericho, Vt., certificate of merit; Moulton's anti-freezing conductors and gutters.

Newton & Co., Albany, N. Y., certificate of highest merit; fire bricks and stove linings.

Novelty Manufacturing Co., Sterling, Ill., certificate of merit; school desk.

Price & Knickerbocker, Albany, N. Y., certificate of highest merit; ornamental grasses and dried flowers.

D. Shepley & Fleming, West Troy, N. Y., certificate of merit; stoneware and pottery.

Elihu Smith, Albany, N. Y., certificate of highest merit; Smith's dry-air refrigerators.

A. B. Van Gaasbeck & Co., Albany, N. Y., certificate of highest merit; exhibition of carpets and Persian rugs.

Van Heusen, Charles & Co., Albany, N. Y., certificate of highest merit; exhibition of china and glass ware.

Maurice E. Viele, Albany, N. Y., certificate of highest merit; exhibition of hardware, cutlery and tools.

Weatherhead & Co., Albany, N. Y., certificate of merit; exhibition of groceries, etc.

Woodward & Hill, Albany, N. Y., certificate of merit; exhibition of saddlery hardware.

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FARM PRODUCE.

GRAIN, SEEDS, ETC., GROWN IN 1880 — WHITE WINTER WHEAT.

J. M. Houghtaling, Adamsville, N. Y., first prize, $10.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $5.

RED WINTER WHEAT.

O. Howland & Son, Auburn, N. Y., first prize, $10.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $5.

SPRING WHEAT.

J. M. Houghtaling, Adamsville, N. Y., second prize, $5.

WINTER RYE.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $10.
Fred. S. Blessing, Slingerlands, N. Y., second prize, $5.

SPRING RYE.

E. Van Allen, Bethlehem, N. Y., second prize, $5.

WHITE OATS.

Geo. W. Bender, New Scotland, N. Y., first prize, $10.
Oscar Larison, Lawrenceville, Penn., second prize, $5.

BLACK OR GRAY OATS.

Fred. S. Blessing, Slingerlands, N. Y., first prize, $10.
D. Van Allen, Adams Station, N. Y., second prize, $5.

TWO-ROWED SPRING BARLEY.

C. W. Canfield, Athens, Penn., first prize, $10.
Jacob J. De Forest, Duanesburgh, N. Y., second prize, $5.

FOUR-ROWED SPRING BARLEY.

Fred. S. Blessing, Slingerlands, N. Y., $5.

YELLOW INDIAN CORN (SHELLED).

Isaac Van Allen, Bethlehem, N. Y., first prize, $10.
J. M. Hougtaling, Adamsville, N. Y., second prize, $5.

WHITE INDIAN CORN (SHELLED).

Isaac Van Allen, Bethlehem, N. Y., first prize, $10.
Fred. S. Blessing, Slingerland's, N. Y., second prize, $5.

FIELD BEANS (LARGE).

Fred. S. Blessing, Slingerlands, N. Y., first prize, $10.
Fred. S. Blessing, Slingerlands, N. Y., second prize, $5.

FIELD BEANS (SMALL).

Fred. S. Blessing, Slingerlands, N. Y., first prize, $10.
Fred. S. Blessing, Slingerlands, N. Y., second prize, $5.

FIELD PEAS (LARGE).

Lewis Brewer, Schenectady, N. Y., first prize, $10.
Fred. S. Blessing, Slingerlands, N. Y., second prize, $5.

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FIELD PEAS (SMALL).

Jacob J. De Forest, Duanesburgh, N. Y., first prize, $10.
C. W. Canfield, Athens, Penn., second prize, $5.

BUCKWHEAT.

Jacob J. De Forest, Duanesburgh, N. Y., first prize, $5.
Lewis Brewer, Schenectady, N. Y., second prize, $3.

TIMOTHY SEED.

J. M. Houghtaling, Adamsville, N. Y., first prize, $5.
Deloss Wentworth, Mohawk, N. Y., second prize, $3.

MILLET.

Fred. S. Blessing, Slingerlands, N. Y., first prize, $5.
E. Van Allen, Bethlehem, N. Y., second prize, $3.

FLAX SEED.

E. Van Allen, Bethlehem, N. Y., second prize, $3.

TWENTY-FIVE SEED EARS YELLOW CORN (EIGHT-ROWED).

D. Van Allen, Adams Station, N. Y., first prize, $5.
Lewis Brewer, Schenectady, N. Y., second prize, $3.

TWENTY-FIVE SEED EARS YELLOW CORN (TWELVE ROWED).

Isaac Van Allen, Bethlehem, N. Y., first prize, $5.
Jones Wilcox, East Chatham, N. Y., second prize, $3.

TWENTY-FIVE SEED EARS WHITE CORN.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $5.
D. Van Allen, Adams Station, N. Y., second prize, $3.

TWENTY-FIVE SEED EARS EARLY SWEET CORN.

D. Van Allen, Adams Station, N. Y., first prize, $5.
Fred. S. Blessing, Slingerlands, N. Y., second prize, $3.

TWENTY-FIVE SEED EARS LATE SWEET CORN.

E. Van Allen, Bethlehem, N. Y., first prize, $5.
Lewis Brewer, Schenectady, N. Y., second prize, $3.

VEGETABLES.

CELERY.

E. Van Allen, Bethlehem, N. Y., first prize, $3.
D. Van Allen, Adams Station, N. Y., second prize, $2.

CAULIFLOWERS.

E. Van Allen, Bethlehem, N. Y., first prize, $3.
Lewis Brewer, Schenectady, N. Y., second prize, $2.

CABBAGES.

E. Van Allen, Bethlehem, N. Y., first prize, $3.
Lewis Brewer, Schenectady, N. Y., second prize, $2.

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TURNIPS.

L. C. Fish, Otego, N. Y., first prize, $3.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $2.

LETTUCE.

Robert Lewis, Castleton, N. Y., first prize, $3.
Robert Lewis, Castleton, N. Y., second prize, $2.

MANGOLDS.

N. M. Curtis, Ogensburgh, N. Y., first prize, $3.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $2.

BEETS.

Lewis Brewer, Schenectady, N. Y., first prize, $3.
E. Van Allen, Bethlehem, N. Y., second prize, $2.

ORANGE CARROTS.

E. Van Allen, Bethlehem, N. Y., first prize, $3.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $2.

WHITE CARROTS.

E. Van Allen, Bethlehem, N. Y., first prize, $3.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $2.

PARSNIPS.

Robert Lewis, Castleton, N. Y., first prize, $3,
Lewis Brewer, Schenectady, N. Y., second prize, $2.

SALSIFY.

Robert Lewis, Castleton, N. Y., first prize, $3.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $2.

KOHL-RABI.

E. Van Allen, Bethlehem, N. Y., first prize, $3.

ONIONS.

E. Van Allen, Bethlehem, N. Y., first prize, $3.
C. W. Canfield, Athens, Pa., second prize, $2.

TOMATOS.

E. Van Allen, Bethlehem, N. Y., first prize, $3.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $2.

EGG PLANT.

Lewis Brewer, Schenectady, N. Y., first prize, $3.
E. Van Allen, Bethlehem, N. Y., second prize, $2.

GARDEN BEANS.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $3.
Fred. S. Blessing, Slingerland's, N. Y., second prize, $2.

PEPPERS.

E. Van Allen, Bethlehem, N. Y., first prize, $3.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $2.

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Squashes.

E. Van Allen, Bethlehem, N. Y., first prize, $3.
Lewis Brewer, Schenectady, N. Y., second prize, $2.

Pumpkins.

Mrs. Ira Harris, Loudonville, N. Y., first prize, $3.
H. Schoonmaker, Cedar Hill, N. Y., second prize, $2.

Sweet Potatoes.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $3.

Collections of Potatoes — Early Varieties.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $10.
A. S. Johnson, Chili Station, N. Y., second prize, $5.

Collections of Potatoes — Late Varieties.

Lewis Brewer, Schenectady, N. Y., first prize, $10.
C. W. Canfield, Athens, Penn., second prize, $5.

Collections of Potatoes — Stock-feeding Varieties.

Fred. S. Blessing, Slingerland's, N. Y., first prize, $10.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $5.

Collections of Vegetables.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $25.

DAIRY PRODUCE, ETC.

Butter.

Special prize for the best six packages, of not less than thirty pounds net each, made in the same creamery or private dairy.

A. C. Biggar, Pepacton, N. Y., first prize, $50.

Packages of not Less than Thirty Pounds Net, made in June, in Private Dairy.

A. C. Biggar, Pepacton, N. Y., first prize, $30.
J. M. Houghtaling, Adamsville, N. Y., second prize, $20.
Wm. F. Ford, West Davenport, N. Y., third prize, $10.

Packages of not Less than Thirty Pounds Net, made at any time, in Private Dairy.

A. C. Biggar, Pepacton, N. Y., first prize, $30.
Wm. F. Ford, West Davenport, N. Y., second prize, $20.
Charles Russell, Delhi, N. Y., third prize, $10.

Samples of not Less than Five Pounds in Prints, Rolls or Moulds.

M. D. Chapin, Poultney, Vt., first prize, $10.
Charles Russell, Delhi, N. Y., second prize, $5.

Cheese.

Special prize for the best dozen cheeses, not less than twenty pounds each, from the same factory or dairy, and suitable for army and other uses.

C. A. Miller, Laona, N. Y., first prize, $50.

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AMERICAN CHEESE OF THE USUAL CHARACTER AND SHAPE, FACTORY OR OTHER, LESS THAN ONE YEAR OLD, NOT LESS THAN TWENTY POUNDS.

W. H. Spooner, Walworth, N. Y., first prize, $30.
Geo. R. Wright, Hartford, N. Y., second prize, $20.
Gerry Bartlett, Laona, N. Y., third prize, $10.

BREAD, SUGAR, ETC. — WHEATEN BREAD.

D. Van Allen, Adamsville, N. Y., first prize, $5.
Jones Wilcox, East Chatham, N. Y., second prize, $3.

RYE BREAD.

Jones Wilcox, East Chatham, N. Y., first prize, $5.
J. M. Houghtaling, Adamsville, N. Y., second prize, $3.

INDIAN OR RYE AND INDIAN BREAD.

E. Van Allen, Bethlehem, N. Y., first prize, $5.
J. M. Houghtaling, Adamsville, N. Y., second prize, $3.

MAPLE SUGAR.

Wm. F. Ford, West Davenport, N. Y., first prize, $5.

MAPLE SYRUP.

Wm. F. Ford, West Davenport, N. Y., first prize, $5.
M. H. Tennant, Stanwix, N. Y., second prize, $3.

PRESERVED FRESH FRUITS.

E. Van Allen, Bethlehem, N. Y., first prize, $5.
Mrs. L. S. Lampman, Albany, N. Y., second prize, $3.

PICKLES IN VINEGAR.

E. Van Allen, Bethlehem, N. Y., first prize, $5.
J. M. Houghtaling, Adamsville, N. Y., second prize, $3.

DRIED APPLES.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $5.
E. Van Allen, Bethlehem, N. Y., second prize, $3.

DRIED PEACHES.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $5.
Mrs. M. S. Blessing, Slingerlands, N. Y., second prize, $3.

DRIED WHORTLEBERRIES.

Mrs. M. S. Blessing, Slingerlands, N. Y., first prize, $5.
Mrs. W. H. Graves, Blossvale, N. Y., second prize, $3.

DRIED RASPBERRIES.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $5.
Lewis Brewer, Schenectady, N. Y., second prize, $3.

BOX HONEY.

P. Miller, Fredonia, N. Y., first prize, $5.
E. Van Allen, Bethlehem, N. Y., second prize, $3.

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EXTRACTED OR STRAINED HONEY.

M. H. Tennant, Stanwix, N. Y., first prize, $5.
C. W. Canfield, Athens, Penn., second prize, $3.

DOMESTIC MANUFACTURES — ALL WOOL HORSE BLANKETS.

Delos Wentworth, Mohawk, N. Y., first prize, $5.
Mrs. C. M. Stone, Blossvale, N. Y., second prize, $3.

WOOLLEN CLOTH.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $5.
Delos Wentworth, Mohawk, N. Y., second prize, $3.

WOOLLEN FLANNEL.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $5.
Mrs. W. H. Graves, Blossvale, N. Y., second prize, $3.

FLANNEL COTTON WARP.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $5.
Mrs. C. M. Stone, Blossvale, N. Y., second prize, $3.

LINSEY WOOLSEY.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $5.
Mrs. W. H. Graves, Blossvale, N. Y., second prize, $3.

RAG CARPET.

Mrs. Frederick Ditman, West Sand Lake, N. Y , first prize, $5.
Mrs. Wm. Taylor, New Scotland, N. Y., second prize, $3.

HEARTH RUGS.

Miss Emma L. Dorr, Albany, N. Y., first prize, $5.
Mrs. J. J. Gallup, Albany, N. Y., second prize, $3.

DOUBLE CARPET COVERLETS.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $5.
Hester Van Allen, Bethlehem, N. Y., second prize, $3.

LINEN KERSEY.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $5.

TOW CLOTH.

Mrs. C. M. Stone, Blossvale, N. Y., second prize, $3.

LINEN BAGGING.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $5.

KNIT BED SPREADS.

Mrs. J. J. Gallup, Albany, N. Y., first prize, $3; worsted.
Mrs. E. A. Wagner, Albany, N. Y., second prize, $2.

WHITE WORKED OR QUILTED BED SPREADS.

Mrs. A. J. Witbeck, New Scotland, N. Y., first prize, $3.
Mrs. Valina C. Melius, Greenbush, N. Y., second prize, $2.

BALMORAL PETTICOATS.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $3.

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WOOLLEN KNIT STOCKINGS.

Mrs. L. P. Tennant, Stanwix, N. Y., first prize, $3.
Mrs. A. J. Witbeck, New Scotland, N. Y., second prize, $2.

WORSTED KNIT STOCKINGS.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $3.
Hester Van Allen, Bethlehem, N. Y., second prize, $2.

WOOLLEN KNIT MITTENS.

Mrs. W. H. Graves, Blossvale, N. Y., first prize. $3.
Miss Emma L. Dorr, Albany, N. Y., second prize, $2.

WOOLLEN FRINGE MITTENS.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $3.
Mrs. W. H. Graves, Blossvale, N. Y., second prize, $2.

LINEN OR COTTON KNIT STOCKINGS.

Mrs. A. J. Witbeck, New Scotland, N. Y., first prize, $3.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $2.

LINEN SEWING THREAD.

Mrs. A. J. Witbeck, New Scotland, N. Y., first prize, $3.
Mrs. C. M. Stone, Blossvale, N. Y., second prize, $2.

FLOWERS, PLANTS AND FRUITS.

FLOWERS, PROFESSIONAL LIST — TWELVE PERENNIAL PHLOXES.

Ellwanger & Barry, Rochester, N. Y., first prize, $3.

FLOWERS, AMATEUR LIST — GENERAL COLLECTIONS OF CUT FLOWERS.

E. Van Allen, Bethlehem, N. Y., first prize, $10.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $5.

COLLECTIONS OF DAHLIAS.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $6.
M. H. Tennant, Stanwix, N. Y., second prize, $3.

SIX DISSIMILAR BLOOMS NAMED.

Miss L. Clement, Bethlehem, N. Y., first prize, $2.

COLLECTIONS OF VERBENAS.

E. Van Allen, Bethlehem, N. Y., first prize, $5.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $3.

TWELVE DISTINCT VARIETIES NAMED.

E. Van Allen, Bethlehem, N. Y., first prize, $3.
E. Van Allen, Bethlehem, N. Y., second prize, $2.

COLLECTIONS OF PHLOXES.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $5.
M. H. Tennant, Stanwix, N. Y., second prize, $3.

COLLECTIONS OF ASTERS.

E. Van Allen, Bethlehem, N. Y., first prize, $3.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $2.

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COLLECTIONS OF PANSIES

M. H. Tennant, Stanwix, N. Y., first prize, $3.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $2.

TEN-WEEK STOCKS.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $3.
M. H. Tennant, Stanwix, N. Y., second prize, $2.

COLLECTIONS OF GLADIOLUS.

E. Van Allen, Bethlehem, N. Y., first prize, $3.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $2.

PLANTS, BOUQUETS, FLORAL DESIGNS, ETC., OPEN TO ALL.—TWENTY GREEN-HOUSE PLANTS AND STOVE PLANTS OF DIFFERENT VARIETIES.

L. Menand, Albany, N. Y., first prize, $10.
L. Menand, Albany, N. Y., second prize, $5.

TEN GREEN-HOUSE AND STOVE PLANTS OF DIFFERENT VARIETIES.

L. Menand, Albany, N. Y., first prize, $5.

SIX VARIETIES OF VARIEGATED LEAVED PLANTS, ETC.

L. Menand, Albany, N. Y., first prize, $5.

SINGLE VARIEGATED LEAVED PLANT.

L. Menand, Albany, N. Y., first prize, $3.

SUCCULENTS—TWELVE DISTINCT VARIETIES.

L. Menand, Albany, N. Y., first prize, $5.

HAND BOUQUETS.

Whittle Bros., Albany N. Y., first prize, $5.

BASKETS OF FLOWERS.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.
Whittle Bros., Albany, N. Y., second prize, $3.

DINNER-TABLE DESIGNS.

L. Menand, Albany, N. Y., first prize, $5.

FRUITS—PROFESSIONAL LISTS, COLLECTIONS OF APPLES.

Ellwanger & Barry, Rochester, N. Y., first prize, $10.

COLLECTIONS OF PEARS.

Ellwanger & Barry, Rochester, N. Y., first prize, $15.

TWENTY VARIETIES OF PEARS.

Ellwanger & Barry, Rochester, N. Y., first prize, $10.

COLLECTIONS OF PEACHES.

Ellwanger & Barry, Rochester, N. Y., second prize, $3.

THREE VARIETIES OF PEACHES.

Ellwanger & Barry, Rochester, N. Y., second prize, $2.

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DISH OF ONE VARIETY.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.
J. S. Stone, Stanwix, N. Y., second prize, $1.

COLLECTIONS OF PLUMS.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.

FIVE VARIETIES OF PLUMS.

Ellwanger & Barry, Rochester, N. Y., first prize, $3.

DISH OF ONE VARIETY.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

QUINCES — TEN SPECIMENS.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

NATIVE GRAPES GROWN IN THE OPEN AIR — COLLECTIONS OF TEN VARIETIES.

Ellwanger & Barry, Rochester, N. Y., first prize, $10.
L. V. Pierce, Fishkill, N. Y., second prize, $5.

FIVE VARIETIES OF NATIVE GRAPES.

L. V. Pierce, Fishkill, N. Y., first prize, $5.
Ellwanger & Barry, Rochester, N. Y., second prize, $3.

FRUITS, AMATEUR LIST — COLLECTIONS OF APPLES.

John W. Chapman, Hartford, N. Y., first prize, $10.
E. Van Allen, Bethlehem, N. Y., second prize, $5.

TEN VARIETIES OF APPLES.

C. L. G. Blessing, Slingerlands, N. Y., first prize, $5.
G. W. Bender, New Scotland, N. Y., second prize, $3.

FIVE VARIETIES OF APPLES.

John W. Chapman, Hartford, N. Y., first prize, $3.
Jacob J. DeForest, Duanesburgh, N. Y., second prize, $2.

PEARS, TEN VARIETIES.

Peter Van Wie, Cedar Hill, N. Y., first prize, $5.
John W. Chapman, Hartford, N. Y., second prize, $3.

FIVE VARIETIES OF PEARS.

John W. Chapman, Hartford, N. Y., first prize, $3.
M. E. Myers, Charlton, N. Y., second prize, $2.

DISH OF ONE VARIETY OF PEACHES.

Mrs. Jas. H. Loucks, Jerusalem, N. Y., first prize, $2.
Liberty Gilbert, Troy, N. Y., second prize, $1.

PLUMS — FIVE VARIETIES.

Peter Van Wie, Cedar Hill, N. Y., first prize, $3.
Mrs. Jas. H. Loucks, Jerusalem, N. Y., second prize, $2.

THREE VARIETIES OF PLUMS.

John W. Chapman, Hartford, N. Y., first prize, $2.
Peter Van Wie, Cedar Hill, N. Y., second prize, $1.

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DISH OF PLUMS — TEN SPECIMENS.

John W. Chapman, Hartford, N. Y., first prize, $1.

QUINCES — DISH OF TEN SPECIMENS.

John W. Chapman, Hartford, N. Y., first prize, $2.

NATIVE GRAPES — GROWN IN THE OPEN AIR — COLLECTIONS OF TEN VARIETIES.

Arthur McCormick, second prize, $3.

FIVE VARIETIES OF GRAPES.

Arthur McCormick, second prize, $2.

FOREIGN GRAPES GROWN UNDER GLASS — FIVE VARIETIES.

Charles W. Little, Albany, N. Y., first prize, $6.

DISH OF ONE VARIETY.

Charles W. Little, Albany, N. Y., first prize, $3.

FRUITS — SINGLE DISHES — OPEN TO ALL.

APPLES — FALL PIPPINS.

Mrs. A. J. Whitbeck, New Scotland, N. Y. first prize, $2.

GRAVENSTEINS.

Henry Schoonmaker, Cedar Hill, N. Y., first prize, $2.

BALDWINS.

C. L. G. Blessing, Slingerlands, N. Y., first prize, $2.

KING OF TOMPKINS COUNTY.

H. W. Garrett, Coeymans Hollow, N. Y., first prize, $2.

NORTHERN SPY.

E. Van Allen, Bethlehem, N. Y., first prize, $2.

RHODE ISLAND GREENINGS.

H. W. Garrett, Coeymans Hollow, N. Y., first prize, $2.

TWENTY-OUNCE.

A. S. Johnson, Chili Station, N. Y., first prize, $3.

ESOPUS SPITZENBURGH.

C. L. G. Blessing, Slingerlands, N. Y., first prize, $2.

PEARS — BARTLETT.

John W. Chapman, Hartford, N. Y., first prize, $2.

DUCHESSE D' ANGOULEME.

J. J. DeForest, Duanesburgh, first prize, $2.

FLEMISH BEAUTY.

John W. Chapman, Hartford, N. Y., first prize, $10.

SECKEL.

E. Van Allen, Bethlehem, N. Y., first prize, $2.

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SHELDON.

M. E. Myers, Charlton, N. Y., first prize, $3.

LAWRENCE.

M. E. Myers, Charlton, N. Y., first prize, $2.

GRAPES — CONCORD.

James Haviland first prize, $2.

DELAWARE.

John W. Chapman, Hartford, N. Y., first prize, $2.

AWARDS.

At the Forty-first Annual Cattle Show and Fair of the New York State Agricultural Society, held at Elmira, September 12 to September 17, 1881.

CATTLE.

SHORTHORNS — SHORTHORN HERD PRIZE.

Benjamin Fellows, Clifton, N. Y., large gold medal.

Bull, Benjamin F., roan, bred by exhibitor, calved April 3, 1879, sire Earl of Oxford 35422, dam Niobe by Clifton Duke 2nd 7711, gr. d. Nannie Williams 10th by Duke of Airdrie 2743.

Cow, Lily of the Valley, roan, bred by George Butts, Manlius, N. Y., calved April 28, 1871, sire Treble Gloster 7331, dam White Lily by Bancroft 5341, gr. d. Lucia by Idle Duke 4903.

Cow, Niobe 1st, red with little white, bred by Judson Howard, Mendon, N. Y., calved January 21, 1873, sire Major 10425, dam Niobe by Clifton Duke 2nd 7711, gr. d. Nannie Williams 10th by Duke of Airdrie 2743.

Cow, Niobe 2nd, red, bred by exhibitor, calved March 7, 1878, sire Treble Gloster 7331, dam Niobe 1st by Major 10425, gr. d. Niobe by Clifton Duke 2nd 7711.

Cow, Niobe 3rd, red, bred by exhibitor, calved March 25, 1878, sire Treble Gloster 7331, dam Niobe by Clifton Duke 2nd 7711, gr. d. Nannie Williams 10th by Duke of Airdrie, 2743.

Heifer, Una, red with a little white, bred by exhibitor, calved December 25, 1879, sire Earl of Oxford 35422, dam Wandering Sprite by Treble Gloster 7311, gr. d. Lilly of the Valley by Treble Gloster 7331.

SHORTHORN BULLS OVER THREE YEARS OLD.

Daniel B. Haight, Dover Plains, N. Y., first prize; $50; Oneida Prince, red, bred by A. W. Griswold, Morristown, Vt., calved October 25, 1875, sire 7th Duke of Oneida 19056, dam Lady Mary by Hotspur 4030 (31393), gr. d. Baroness by Barrington (30501).

Edwin C. Cook, Bath, N. Y., second prize, $25; Bright Lad, red with a little white, bred by Charles H. Robie, Savona, N. Y., calved April 18, 1874, sire Alaric 18863, dam Lady of Steuben by Kirk's Oxford 10327, gr. d. Hope 10th by Usurper 5237.

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SHORTHORN BULLS TWO YEARS OLD.

B. C. Rumsey, Buffalo, N. Y., first prize, $40; Duke of Huntsland, red, bred by Sir Curtis Lampson, England, calved June 17, 1879, Sire 2nd Duke of Underley (36551), dam Siddington 12th by 2nd Duke of Tregunter (25022), gr. d. Siddington 2nd by 4th Duke of Oxford (11387).

Benjamin Fellows, Clifton, N. Y., second prize, $20; Benjamin F., roan, bred by exhibitor, calved April 13, 1879, sire Earl of Oxford 35423, dam Niobe by Clifton Duke 2nd 7711, gr. d. Nannie Williams 10th by Duke of Airdrie 2743.

SHORTHORN BULLS ONE YEAR OLD.

B. C. Rumsey, Buffalo, N. Y., first prize $30; Baron Trenck, red, bred by Richard Gibson, Ilderton, Ont., Canada, calved December 31, 1879, sire 7th Lord Oxford 17586, dam Ursuline 2nd by Baron Lisgar 11190, gr. dam Undine by 3rd Duke of Airdrie (23717).

Daniel B Haight, Dover Plains, N.Y., second prize, $15; Waterloo 3rd, red, bred by exhibitor, calved May 25, 1880, sire Oneida Prince 27359, dam Constance of Lyndale 2nd by Scotsman 27435, gr. d. Constance 6th by 7th Duke of Airdrie (23718).

SHORTHORN COWS OVER THREE YEARS OLD.

Benjamin Fellows, Clifton, N. Y., first prize, $40; Niobe 2nd, red, bred by exhibitor, calved March 7, 1878, sire Treble Gloster 7331, dam Niobe 1st by Major 10425, gr. d. Niobe by Clifton Duke 2nd 7711.

Benjamin Fellows, Clifton, N. Y., second prize, $20; Niobe 1st, red with a little white, bred by Judson Howard, Mendon, N. Y., calved January 21, 1873, sire Major 10425, dam Niobe by Clifton Duke 2nd 7711, gr. d. Nannie Williams 10th by Duke of Airdrie 2743.

SHORTHORN HEIFERS TWO YEARS OLD.

Daniel B. Haight, Dover Plains, N. Y., first prize, $30; Constance of Brookdale 4th, roan, bred by exhibitor, calved September 24, 1878, sire Oneida Prince 27359, dam Constance 6th by Seventh Duke of Airdrie (23718), gr. d. Constance 3rd by Clifton Duke (23580).

Benjamin Fellows, Clifton, N. Y. second prize, $15; Prairie Bell, red with a little white, bred by exhibitor, calved October 24, 1878, sire Treble Gloster 7331, dam Prairie Blossom by Royal Crown 10916, gr. d. Prairie Lass by Scotchman 7253.

SHORTHORN HEIFERS ONE YEAR OLD.

Daniel B. Haight, Dover Plains, N. Y., first prize, $20; Constance of Brookdale 7th, dark roan, bred by exhibitor, calved December 16, 1879, sire Baron of Brookdale 28511, dame Constance 5th by Earl of Seaham 8077, gr. d. Constance 3rd by Clifton Duke 3760 (23580).

Benjamin Fellows, Clifton, N. Y., second prize, $10; Una, red with a little white, bred by exhibitor, calved December 25, 1879, sire Earl of Oxford 35422, dam Wandering Sprite by Treble Gloster 7331, gr. d. Lily of the Valley by Treble Gloster 7331.

SHORTHORN HEIFER CALVES OVER FIVE MONTHS OLD.

Benjamin Fellows, Clifton, N. Y., first prize, $10; Ormolu 4th, roan, bred by exhibitor, calved March 29, 1881, sire Earl of Oxford 35422, dam Ormolu 2nd by Imperial Gloster 20026, gr. d. Orange Blossom by Treble Gloster 7331.

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William S. Moore, Jr., Mount Upton, N. Y., second prize, $5; Lady May of Upton, red, bred by exhibitor, calved February 5, 1881, sire Pride of Upton, dam Lady Linnburn 2nd by Brœmar 9556, gr. d. Lady Linnburn by Montrose 5971.

DEVONS — DEVON HERD PRIZE.

William H. Jones, South Montrose, Penn., large gold medal.

Bull, Prince of Wales, bred by Orrin Pritchard, Springville, Penn., calved May 18, 1877, sire Prince of Wales 12th 1002, dam Peony 2nd by Comet 420, gr. d. Peony by Bloomfield 313.

Cow, Pet, bred by Orrin Pritchard, Springville, Penn., calved April 19, 1873, sire Prince of Wales 8th 1000, dam Peony by Bloomfield 313, gr. d. Longhorn Baltimore by Norfolk 123.

Cow, Pride 3rd, bred by exhibitor, calved June 19, 1875, sire Prince of Wales 12th 1002, dam Pride 2nd by Prince of Wales 8th 1000, gr. d. Pride by Comet 420.

Cow, Rose of May, bred by exhibitor, calved May 27, 1876, sire Prince of Wales 12th 1002, dam Old Rose 3rd by Comet 420, gr. d. Old Rose 2nd by Prince Albert 969.

Cow, Pauline, bred by exhibitor, calved June 5, 1878, sire Helena's Huron 8th 663, dam Rose of May by Prince of Wales 12th 1002, gr. d. Old Rose 3rd by Comet 420.

Heifer, Leva, bred by exhibitor, calved April 20, 1879, sire Prince of Wales 751½, dam Pride 2nd by Prince of Wales 8th 1000, gr. d. Pride by Comet 420.

DEVON BULLS OVER THREE YEARS OLD.

William M. White, Canaseraga, N. Y., first prize, $50; Independence, bred by Joseph Holmes, Bozrahville, Conn., calved July 4, 1875, sire Hyde's Fazio 707, dam Fairy 9th by Comet 34, gr. d. Fairy 4th by Comet 34.

J. A. Pomeroy, Sidney Centre, N. Y., second prize, $25; Uncas, bred by Joseph Holmes, Bozrahville, Conn., calved July 26, 1873, sire Hyde's Fazio 707, dam Fairy 9th by Comet 34, gr. d. Fairy 4th by Comet 34.

DEVON BULLS TWO YEARS OLD.

E. M. Johnston & Son, Afton, N. Y., first prize, $40; Bloomfield, bred by J. B. Longenecker, Union Deposit, Penn., calved March 18, 1879, sire Springfield 1141, dam Mountain Maid by The President 137, gr. d. Fairy by Chatsworth 30.

William H. Jones, South Montrose, Penn., second prize, $20; Mordecai, bred by E. E. Tiffany, Brooklyn, Penn., calved March 19, 1879, sire Prince of Orange 1761, dam Edith 7th by Prince of Wales 151, gr. d. Edith 2nd by Sachem 1089.

DEVON BULLS ONE YEAR OLD.

D. Wait, Wells Bridge, N. Y., first prize, $30; Otsego, bred by exhibitor, calved January 20, 1880, sire Candy 2nd 804, dam Beauty by Madison Chief 814, gr. d. Queen of May 1st by Madison Chief 814.

A. F. Bronson, Vernon, N. Y., second prize, $15; Jeddo, bred by James Buckingham, Zanesville, Ohio, calved March 31, 1880, sire Hudson 556, dam Nemophila 3rd by Jack 565, gr. d. Nemophila by Omer Pasha 1001.

DEVON BULL CALVES OVER FIVE MONTHS OLD.

J. A. Pomeroy, Sidney Centre, N. Y., first prize, $10; Sunrise, bred by exhibitor, calved January 27, 1881, sire Hartland (old No. 1231), dam Augusta by Genesee 2nd 616, gr. d. Jenny Lind 8th by Mohawk 872.

George H. Bell, Rome, N. Y., second prize, $5; Highland Duke 2nd, bred by exhibitor, calved March 28, 1881, sire Highland Duke 1384, dam Jane 2nd by Cheeango 390, gr. d. Jane by Huron 2nd 704.

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DEVON COWS OVER THREE YEARS OLD.

B. F. Peck, East Bethany, N. Y., first prize, $40; Candy Girl 2nd, bred by Walter Cole, Batavia, N. Y., calved April 13, 1872, sire Lovely's Huron 3rd 806, dam Candy Girl by Empire 5th 536, gr. d. Lovely 8th by Candy 25.

William H. Jones, South Montrose, Penn., second prize, $20; Pet, bred by Orrin Pritchard, Springville, Penn., calved April 19, 1873, sire Prince of Wales 8th 1000, dam Peony by Bloomfield 318, gr. d. Longhorn Baltimore by Norfolk 123.

DEVON HEIFERS TWO YEARS OLD.

William H. Jones, South Montrose, Penn., first prize, $30; Leva, bred by exhibitor, calved April 20, 1879, sire Prince of Wales 751½, dam Pride 2nd by Prince of Wales 8th 1000, gr. d. Pride by Comet 420.

Ensign & Brown, Jeddo, N. Y., second prize, $15; Hollyberry, bred by A. F. Bronson, Vernon, N. Y., calved March 21, 1879, sire Doctor 462, dam Verna by Litchfield 789, gr. d. Belle by Grant 638.

DEVON HEIFERS ONE YEAR OLD.

William M. White, Canaseraga, first prize, $30; Lovely 34th, bred by Walter Cole, Batavia, N. Y., calved April, 1880, sire Cole's Puritan 3rd 406, dam Lovely 24th by Red Jacket 1033, gr. d. Wanda by Queen Anne's Huron 1014.

D. Wait, Wells Bridge, N. Y., second prize, $10; Rosy 2nd, bred by exhibitor, calved April 6, 1880, sire Delaware 1835, dam Rosy by Madison Chief 814, gr. d. Queen of Cleveland by Otsego 1st 929.

DEVON HEIFER CALVES OVER FIVE MONTHS OLD.

William M. White, Canaseraga, N. Y., first prize, $10; Wanda 3rd, bred by exhibitor, calved February 23, 1881, sire Burnett 1648, dam Nunda 2nd, by Queen Anne's Huron 1014, gr. d. Lovely 18th by Young Exeter 546.

A. F. Bronson, Vernon, N. Y., second prize $5; Harley, bred by exhibitor, calved April 1, 1881, sire Brant 1344, dam Verna by Litchfield 789, gr. d. Bell by Grant 638.

HEREFORDS—HEREFORD HERD PRIZE.

Erastus Corning, Albany, N. Y., large gold medal.

Bull, Comus, red with white face, bred by P. Turner, Pembridge, Herefordshire, England; calved July 1, 1872, sire Provost (4067), dam Kathleen by Bolingbroke (1883), gr. d. Redwing by Felix (953).

Cow, Marchioness 2nd, red with white face, bred by exhibitor, calved April, 1869; sire Major, dam Marchioness by Washington (5134), gr. d. Lady, imported.

Cow, Victoria 6th, red with white face, bred by exhibitor, calved June 12, 1874, sire Taurus, dam Victoria 5th by S. Goddard, gr. d. Victoria 4th by Cardinal Wiseman.

Cow, Katy, red with white face, bred by exhibitor, calved April, 1875; sire Comus (4457), dam Princess 2nd by Washington (5134), gr. d. Princess, imported.

Heifer, Edna, red with white face, bred by exhibitor, calved February 9, 1879; sire Comus (4457), dam Victoria 6th by Taurus, gr. d. Victoria 5th by S. Goddard.

Heifer, Echo, red with white face, bred by exhibitor, calved January 22, 1880, sire Comus (4457), dam Marchioness 2nd by Major, gr. d. Marchioness by Washington (5134).

HEREFORD BULLS OVER THREE YEARS OLD.

Erastus Corning, Albany, N. Y., first prize, $50; Comus, red with white face, bred by P. Turner, Pembridge, Herefordshire, England, calved July 21, 1872, sire Provost (4067), dam Kathleen by Bolingbroke (1883), gr d. Redwing by Felix (953).

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John Merryman, Hayfields, Md., second prize, $25; Prince of the Wye, red with white face, bred by Thomas Duckham, Baysham Court, Herefordshire, calved January 21, 1878, sire Helianthus (4641), dam Venus 10th by Pearldiver (4009), gr. d. Venus 9th by Challenge (3005).

HEREFORD BULLS ONE YEAR OLD.

Erastus Corning, Albany, N. Y., first prize, $30; Victor, red with white face, bred by exhibitor, calved December 26, 1879, sire Comus (4457), dam Victoria 6th by Taurus, gr. d. Victoria 5th by S. Goddard.

HEREFORD BULL CALVES OVER FIVE MONTHS OLD.

John Merryman, Hayfields, Md., first prize, $10; John Shaw, red with white face, bred by exhibitor, calved November 26, 1880, sire Illinois (5395), dam Mary by Sir Richard 2nd (4984), gr. d. Meg Merrilies by Admiral (2375).

HEREFORD COWS OVER THREE YEARS OLD.

Erastus Corning, Albany, N. Y., first prize, $40; Katy, red with white face, bred by exhibitor, calved April, 1875, sire Comus (4457), dam Princess 2nd by Washington (5134), gr. d. Princess, imported.

John Merryman, Hayfields, Md., second prize, $20; Princess Charlotte, red with white face, bred by exhibitor, calved April 8th, 1877, sire Sir Richard 2nd (4984), dam Giantess by Sir Oliver 2nd (1733), gr. d. Gay Lass by Riff Raff (1052).

HEREFORD HEIFERS TWO YEARS OLD.

Erastus, Corning, Albany N. Y., first prize, $30; Edna, red with white face, bred by exhibitor; calved February 9, 1879, sire Comus (4457), dam Victoria 6th by Taurus, gr. d. Victoria 5th by S. Goddard.

John Merryman, Hayfields, Md., second prize, $15; Dorothy Vernon, red with white face, bred by exhibitor, calved March 12, 1879, sire Illinois (5395), dam Queen of Athens by Sir Richard 2nd (4984), gr. d. Jennie Clark by Admiral (2375).

HEREFORD HEIFERS ONE YEAR OLD.

Erastus Corning, Albany, N. Y., first prize, $20; Echo, red with white face, bred by exhibitor, calved January 22, 1880, sire Comus (4457), dam Marchioness 2nd by Major, gr. d. Marchioness by Washington (5134).

John Merryman, Hayfields, Md., second prize, $10; Bonnets of Blue, red with white face, bred by exhibitor, calved October 10, 1879, sire Illinois (5395), dam Bell McAlpine by Sir Richard 2nd (4984), gr. d. Hatty by Curly (801).

HEREFORD HEIFER CALVES OVER FIVE MONTHS OLD.

John Merryman, Hayfields, Md., first prize, $10; Princess Louise 3rd, red with white face, bred by exhibitor, calved December 14, 1880, sire Illinois (5395), dam Princess Louise by Sir Richard 2nd (4984), gr. d. Giantess by Sir Oliver 2nd (1733).

AYRSHIRES — AYRSHIRE HERD PRIZE.

Ormiston Brothers, Cuba, N. Y., large gold medal.

Bull, Joe Mars, red and white, bred by Jardine & Sons, Hamilton, Ont., calved July 1878, sire 887 'Mars 1st, dam Queen Mary by 773 Cherokee, gr. d. Bonny Jess, imported by Jardine & Sons.

Cow, Bowment Maid, red and white, bred by James Brodie & Son, Rural Hill, N. Y., calved May 1, 1876, sire Duke of Buccleuch 1091, dam Violet by John Gilpin 222, gr. d. Star by Tam Glen 366.

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Cow, Duchess of Vinevale, dark red and white, bred by Jardine & Sons, Hamilton, Ont., calved September 22, 1877, sire 887 Mars 1st, dam Bonny Jess, imported by Jardine & Sons.

Heifer, Clara B. Mars, dark red with a little white, bred by Jardine & Sons, Hamilton, Ont., calved September 11, 1878, sire 887 Mars 1st, dam Jean Muir (by Billy Muir out of Bonny Jess, both imported by Jardine & Sons).

Heifer, Lady Bruce, red and white, bred by Jardine & Sons, Hamilton, Ont., calved September 6, 1879, sire Robert Bruce,* dam Phyllis Mars by 887 Mars 1st, gr. d. Burns' Jean, imported by Jardine & Sons.

Heifer, Princess 4th, red and white, bred by Jardine & Sons, Hamilton, Ont., calved September 14, 1879, sire Billy Muir (imported), dam Kitty Mars by 887 Mars 1st, gr. d. Princess Louise, imported by Jardine & Sons.

AYRSHIRE BULLS OVER THREE YEARS OLD.

William H. Seeger, Colliers, N. Y., first prize, $50; Glasgow 3rd, red and white, bred by Porter G. Northrop, Franklin, N. Y., calved April, 1878, sire Glasgow 2nd 2347, dam Pearl by Dundas 532, gr. d. Lily by Duke of Hamilton 528.

Ormiston Brothers, Cuba, N. Y., second prize, $25; Joe Mars, red and white, bred by Jardine & Sons, Hamilton, Ont., calved July, 1878, sire 887 Mars 1st, dam Queen Mary by 773 Cherokee, gr. d. Bonny Jess, imported by Jardine & Sons.

AYRSHIRE BULLS TWO YEARS OLD.

H. L. Hawks, Wells Bridge, N. Y., first prize, $40; Chieftain, red and white, bred by Thomas Miller, Brushland, N. Y., calved March 10, 1879, sire Linden Lad 2nd 2499, dam Rosy, imported by Mr. Miller.

A. S. Shimer, Redington, Penn., second prize, $20; Gilt Edge, brown and white, bred by Edward L. Coy, West Hebron, N. Y., calved April 16, 1879, sire 463 Royal Rose, dam Prudy by 12 Bannock, gr. d. Kate 4th by 12 Bannock.

AYRSHIRE BULLS ONE YEAR OLD.

Ormiston Brothers, Cuba, N. Y., first prize, $30; William Mars, red and white bred by Jardine & Sons, Hamilton, Ont., calved October 23, 1879, sire Billy Muir, dam Highland Mary, both imported by Jardine & Sons.

H. R. C. Watson, West Farms, N. Y., second prize, $15; Gayarre, mostly red, bred by J. F. Converse, Woodville, N. Y., calved April 4, 1880, sire Woodville Chief 1542, dam Bessie Bell, imported, by Gilpin, gr. d. Flecky.

AYRSHIRE BULL CALVES OVER FIVE MONTHS OLD.

Ormiston Brothers, Cuba, N. Y., first prize, $10; John Mars, brown with a little white, bred by exhibitors, calved March 12, 1881, sire 847 Joe Mars, dam Lady Marian, imported by Moyer & McAdam.

G. H. Bell, Rome, N. Y., second prize, $5; Roman Prince, red and white, bred by exhibitor, calved March 30, 1881, sire Jerry,† dam Draxy Miller by Treasurer 1509, gr. d. Pet by Rob Roy 325.

AYRSHIRE COWS OVER THREE YEARS OLD.

H. R. C. Watson, West Farms, N. Y., first prize $40; Rosie 4th, red and white, bred by the late William Watson, calved October 21, 1876, sire Belcher 965, dam Rosie by Wallace 392½, gr. d. Julia, imported.

* By 968 Wilson, dam Burns' Jean, imported.

† Bred by Charles Stillman, sire Ronald 1435, dam Daffy by Roderick 827, gr. d. Hattie 2nd by Abraham Lincoln 404.

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Charles Stillman, Alfred Centre, N. Y., second prize, $20; Dell 2nd, red with a little white, bred by exhibitor, calved March 2, 1877, sire Ronald 1435, dam Dell by Ronald 1435, gr. d. Hattie by Cashier 464.

AYRSHIRE HEIFERS TWO YEARS OLD.

Ormiston Brothers, Cuba, N. Y., first prize, $30; Clara B. Mars, dark red with a little white, bred by Jardine & Sons, Hamilton, Ont., calved September 11, 1878, sire 887 Mars 1st, dam Jean Muir (by Billy Muir, out of Bonnie Jess, both imported by Jardine & Sons.

G. H. Bell, Rome, N. Y., second prize, $15; Bertha, white and red, bred by S. Dering, Utica, N. Y., calved March 23, 1879, sire 853 Kilmarnock 2nd, dam Maggie Mitchell by The General 1498, gr. d. Draxy Miller by Treasurer 1509.

AYRSHIRE HEIFERS ONE YEAR OLD.

Charles Stillman, Alfred Centre, N. Y., first prize, $20; Oriana, red with a little white, bred by exhibitor, calved March 26, 1880, sire Dandie,* dam Lightfoot by Roland 1435, gr. d. Maggie by Dundee 5th 1601.

Ormiston Brothers, Cuba, N. Y., second prize, $10; Lady Bruce, red and white, bred by Jardine & Sons, Hamilton, Ont., calved September 6, 1879, sire Robert Bruce, † dam Phyllis Mars by 887 Mars 1st, gr. d. Burns' Jean, imported by Jardine & Sons.

AYRSHIRE HEIFER CALVES OVER FIVE MONTHS OLD.

H. R. C. Watson, West Farms, N. Y., first prize, $10; Bonnie Jessie, dark red and white, bred by the estate of William Watson, calved February 12, 1881, sire Joseph 1st 2236, dam Anna 2nd by Belcher 965, gr. d. Anna by Angus 1550.

A. S. Shimer, Redington, Penn., second prize, $5; Milk Cow, red, bred by exhibitor, calved January 15, 1881, sire 819 Gilt Edge, dam Milk Pail by 463 Royal Rose, gr. d. Flyaway by 303 Duke of Hartford.

HOLSTEINS — HOLSTEIN HERD PRIZE.

Smiths & Powell, Syracuse, N. Y., large gold medal.

Bull, Uncle Tom, black and white, bred by G. S. Miller, Peterborough, N. Y., calved April 17, 1875, sire Rip Van Winkle 35, dam Topsy by Hollander 20, gr. d. Dowager, imported by Mr. Miller.

Cow, Neilson, black and white, bred by Peter Knip, Beemster, North Holland, calved March, 1873, sire District Bull.

Cow, Ægis, black and white, bred by G. S. Miller, Peterborough, N. Y., calved October 2, 1873, sire Rip Van Winkle 35, dam Agoo, imported.

Cow, Duchess of Friesland, black and white, bred by K. N. Kuperus, Marssum, Friesland, calved March 7, 1877, sire Wartena, dam Olivier.

Cow, Lady of the Lake, black and white, bred by C. Koning, Beemster, North Holland, calved March 30, 1878.

Cow, Ægis 2nd, black and white, bred by exhibitors, calved May, 24, 1878; sire Uncle Tom 163, dam Ægis by Rip Van Winkle 35, gr. d. Agoo, imported.

HOLSTEIN BULLS OVER THREE YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $50; Uncle Tom, black and white, bred by G. S. Miller, Peterborough, N. Y., calved April 17, 1875, sire Rip Van Winkle 35, dam Topsy by Hollander 20, gr. d. Dowager, imported by Mr. Miller.

* By Ronald 1435, dam Daffy by Roderick 897, gr. d. Hattie 2nd.

† By 968 Wilson, dam Burns' Jean, imported.

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H. S. Easton, Mitchellville, N. Y., second prize, $25; Frederick, white and black, bred by T. G. Maxwell and Brothers, Geneva, N. Y., calved May 22, 1877, sire Dictator 82, dam Berenice, imported by W. A. Russell, Lawrence, Mass.

HOLSTEIN BULLS TWO YEARS OLD.

H. L. Shaffee, Horseheads, N. Y., first prize, $40; Executor, black and white, bred by H. C. Hoffman, Horseheads, N. Y., calved March 9, 1879, sire Holland Prince 113, dam Belle, imported.

G. B. Fletcher, Afton, N. Y., second prize, $20; Burgomaster 2nd, bred by the Unadilla Valley Stock Breeders Association, calved June 25, 1876, sire Burgomaster of the Beemster, and dam Aaltji Hengerveld, both imported by T. E. Whiting, Concord, Mass.

HOLSTEIN BULLS ONE YEAR OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $30; Netherland Prince, black and white, bred by A. S. Koning, Beemster, North Holland, calved April 1, 1880, sire, Schimmel, dam Lady Netherland.

Howard G. White, Syracuse, N. Y., second prize, $15; Maharajah, black and white, bred by exhibitor, calved April 1, 1880, sire Marssum 423, dam Josephine, imported by exhibitor.

HOLSTEIN BULL CALVES OVER FIVE MONTHS OLD.

Howard G. White, Syracuse, N. Y., first prize, $10; Algoma, black and white, bred by exhibitor, calved January 1, 1881, sire Marssum 423, dam Dagmar, imported.

Howard G. White, Syracuse, N. Y., second prize, $5; Prince Bismarck, black and white, bred by exhibitor, calved February 20, 1881, sire Corujum 424, dam Vlaaske, imported by exhibitor.

HOLSTEIN COWS OVER THREE YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $40; Netherland Queen, black and white, bred by A. C. Koning, Beemster, North Holland, calved March 26, 1877, dam Lady Netherland.

Smiths & Powell, Syracuse, N. Y., second prize, $20; Ægis, black and white, bred by G. S. Miller, Peterborough, N. Y., calved October 2, 1873, sire Rip Van Winkle 35, dam Agoo, imported.

HOLSTEIN HEIFERS TWO YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $30; Carlotta, black and white, bred by C. Beets, Purmer, North Holland, calved March, 1879, sire District Bull.

Howard G. White, Syracuse, N. Y., second prize, $15; Princess Dagmar, black and white, bred by exhibitor, calved February 11, 1879, sired in Holland, dam Vlaaske, imported by exhibitor.

HOLSTEIN HEIFERS ONE YEAR OLD.

Howard G. White, Syracuse, N. Y., first prize, $20; Princess Alice, black and white, bred by exhibitor, calved May 2, 1880, sire Marssum, 423, dam Lolkje, imported by exhibitor.

Smiths & Powell, Syracuse, N. Y., second prize, $10; Parepa Rosa, black and white, bred by C. De Boer, Midwoud, North Holland, calved March 26, 1880.

HOLSTEIN HEIFER CALVES OVER FIVE MONTHS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $10; Meadow Lily 2nd, black and white, bred by exhibitors, calved March 15, 1881, sire Uncle Tom 103, dam Meadow Lily by son of Schrender.

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Smiths & Powell, Syracuse, N. Y., second prize, $5; Onondaga Princess 2nd, black and White, bred by exhibitors, calved January 23, 1881, sire Krelis (in Holland), dam Onondaga Princess, imported.

JERSEYS — JERSEY HERD PRIZE.

William Simpson, New York, N. Y., large gold medal.

Bull, Invincible, gray, bred by exhibitor; calved December 1, 1879, sire Thorndale 2582, dam Phædra by Mercury, 432, gr. d. Leda by Jupiter 93.

Cow, Clytemnestra 2nd, solid gray, bred by William Watson, New York, calved November 26, 1874, sire William Hudson, 905, dam Clytemnestra by Mercury 432, gr. d. Leda by Jupiter 93.

Cow, Torfrida, solid brown, bred by R. M. Hoe, New York, calved July 4, 1874, sire Rioter 2nd 469, dam Europa by Jupiter 93, gr. d. Alphea by Saturn 94.

Cow, Iola, solid gray, bred by Herbert Mead, Lake Waccabuc, N. Y., calved August 9, 1875, sire Mercury 432, dam Gussie Richards by Admiral, 372, gr. d. Lady Richards by John Bull, 358.

Cow, Faustine, solid fawn, bred by Herbert Mead, Lake Waccabuc, N. Y., calved March 10, 1878, sire Mopsus 1165, dam Antianira by Mercury 432, gr. d. Proserpine, imported by Richard M. Hoe.

Cow, Archduchess, solid fawn, bred by E. Denize, in Jersey, calved June 4, 1878, sire Grand Duke 173, dam Butterfly.

JERSEY BULLS OVER THREE YEARS OLD.

Charles Stillman, Alfred Centre, N. Y., first prize, $50; Allegany Chief, gray and black, bred by James A. Hayt, Patterson, N. Y., calved May 6, 1877, sire Signal 1170, dam Corolla by Grand Duke Alexis 1040, gr. d. Bell Hartford by Rob Roy 17.

George Sidney Camp, Owego, N. Y., second prize, $25; Alonzo, smoky fawn, bred by exhibitor, calved May 12, 1875, sire Beacon Comet 13th 1281, dam Patchogue by Monadnock 258, gr. d. Islip 2nd by Hornblende 51.

JERSEY BULLS TWO YEARS OLD.

Erastus Corning, Albany, N. Y., first prize, $40; Diavolo, gray, fawn and black, bred by exhibitor, calved July 31, 1879, sire Stockwell 3rd 2770, dam Tranquillity by Stockwell 3rd 2770, gr. d. Daisy Mortua, imported by exhibitor.

W. L. & W. Rutherford, Waddington, N. Y., second prize, $20; Remarkable Duke, gray fawn, bred by Moses Ellis, Framingham, Mass., calved January 31, 1879, sire Sweepstakes Duke 1905, dam Remarkable, imported by Mr. Ellis.

JERSEY BULLS ONE YEAR OLD.

William Simpson, New York, N. Y., first prize, $30; Invincible, gray, bred by exhibitor, calved December 1, 1879, sire Thorndale 2582, dam Phædra by Mercury 432, gr. d. Leda by Jupiter 93.

William Simpson, New York, N. Y., second prize, $15; Fame, solid fawn, bred by H. P. Hopkins, Buffalo, N. Y., calved April 19, 1880, sire Lord Shaftesbury 2499, dam May Blossom by Litchfield 674, gr. d. Bessie Allen by Tom Dasher 420.

JERSEY BULL CALVES OVER FIVE MONTHS OLD.

William Simpson, New York, N. Y., first prize, $10; Bonanza, gray, bred by exhibitor, calved November 1, 1880, sire Bluetooth 1821, dam Phædra by Mercury 432, gr. d. Leda by Jupiter 93.

W. L. & W. Rutherford, Waddington, N. Y., second prize, $5; Royal Dane 9th, bred by exhibitors, calved March 27, 1881, sire Royal Dane 3254, dam Kerni 3rd, by Earl of Brookside 1677, gr. d. Kerni by Tarquin 750.

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JERSEY COWS OVER THREE YEARS OLD.

William Simpson, New York, N. Y., first prize, $40; Torfrida, solid brown, bred by R. M. Hoe, New York, calved July 4, 1874, sire Rioter 2nd 469, dam Europa by Jupiter 93, gr. d. Alphea by Saturn 94.

Erastus Corning, Albany, N. Y., second prize, $20; Lettie Wing, dark fawn and black, bred by Thomas H. Faile, West Farms, N. Y., calved April 29, 1873, sire Mercury 432, dam Winglet, imported by Davis Collamore.

JERSEY HEIFERS TWO YEARS OLD.

William Simpson, New York, N. Y., first prize, $30; Idaline, gray, bred by V. Barber, Decatur, Ill., calved October 22, 1878, sire Secco 1673, dam Tyca by Mercury 432, gr. d. Hybla by Dolphin 2nd 363.

Erastus Corning, Albany, N. Y., second prize, $15; Jersey Lass 2nd, gray, fawn and white, bred by exhibitor, calved September 4, 1878, sire Stockwell 3rd 2770, dam Jersey Lass, imported by exhibitor.

JERSEY HEIFERS ONE YEAR OLD.

William Simpson, New York, N. Y., first prize, $20; Maritana, fawn, bred by F. Le Brocq, Isle of Jersey, calved June 29, 1880, sire Farmer's Glory (274).

George Sidney Camp, Owego, N. Y., second prize, $10; Lorinda 2nd, fawn, bred by exhibitor, calved October 6, 1879, sire Beacon Comet 13th 1281, dam Lorinda of Tioga by Kilbourn 2029, gr. d. Molly Oaks, imported.

JERSEY HEIFER CALVES OVER FIVE MONTHS OLD.

W. L. & W. Rutherford, Waddington, N. Y., first prize, $10; Cora Lee, bred by exhibitors, calved October 18, 1880, sire Kahela 2nd 4531, dam Cad Lee 2nd by Aurora Borealis 2408, gr. d. Cad Lee by Von Bismarck 2nd 1779.

A. G. Barlow & Co., North Ridgeway, N. Y., second prize, $5; Janaire 4th, reddish fawn and white, bred by exhibitors, calved March 7, 1881, sire Bristol Chief 2nd 3218, dam Janaire by Billy Norton 2014, gr. d. Clover Bud by Monitor 878.

GUERNSEYS — GUERNSEY HERD PRIZE.

L. W. Ledyard, Cazenovia, N Y., large gold medal.

Bull, Fernwood, orange, fawn and white, bred by exhibitor, calved April 2, 1878, sire John Mauger's bull (in Guernsey), dam Fernwood Fancy, imported.

Cow, Old Comfortable, orange, fawn and white, bred by T. H. Ogier, Ville Bonder, Vale Parish, calved 1874, sire, Mr. Ogier's bull.

Cow, Clementina, orange, fawn and white, bred by D. O. Le Patourel, in Guernsey, calved June. 1875, sire Excelsior 1st, dam Clementina.

Cow, Elegante, orange, fawn and white. bred by S. Le Pelley, in Guernsey, calved spring of 1875, sire Excelsior 1st, dam Elegante.

Cow, Fernwood Fancy, orange, red and white, bred by Elizabeth De Garis, St. Saviours, Guernsey, calved December, 1876, imported by C. M. Beach, Hartford, Conn.

Cow, Maiden Hair, orange, fawn and white, bred by Thomas Mahey, in Guernsey, calved April, 1878, sire Charley, dam Mahey's cow.

GUERNSEY BULLS OVER THREE YEARS OLD.

L. W. Ledyard, Cazenovia, N. Y., first prize, $50; Fernwood, orange, fawn and white, bred by exhibitor, calved April 2, 1878, sire John Mauger's bull (in Guernsey), dam Fernwood Fancy, imported.

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F. T. Blood, Le Roy, N. Y., second prize, $25; Calumet, fawn and white, calved February 4, 1878, imported from Guernsey, in dam Clytie, by M. C. Weld, New York, N. Y.

GUERNSEY BULLS TWO YEARS OLD.

George Sidney Camp, Owego, N. Y., second prize, $20; Forest Junior, light fawn, bred by exhibitor, calved October 22, 1878, sire Forest 43, dam Rose Forest, imported.

GUERNSEY BULLS ONE YEAR OLD.

L. W. Ledyard, Cazenovia, N. Y., first prize, $30; Gold Fern, orange, fawn and white, bred by William Burridge, St. Andrew's Parish, Guernsey, calved December, 1879, sire St. Andrew 2nd, dam Nellie.

GUERNSEY BULL CALVES OVER FIVE MONTHS OLD.

L. W. Ledyard, Cazenovia, N. Y., first prize, $10; Tivoli, red and white, bred by exhibitor, calved October 8, 1880, sire Charley (in Guernsey), dam Thetis, imported by exhibitor, by Billy 1st.

A. S. Shimer, Redington, Penn., second prize, $5; Duke of Central Park Farm, orange, fawn and white, bred by J. W. Fuller, Catasauqua, Penn, calved September 23, 1880, sire Fair Lad 2nd 75, dam Lily 2nd by Fair Lad 71, gr. d. Lily, imported.

GUERNSEY COWS OVER THREE YEARS OLD.

L. W. Ledyard, Cazenovia, N. Y., first prize, $40; Clementina, orange, fawn and white, bred by D. O. Le Patourel, in Guernsey, calved June, 1875, sire Excelsior 1st, dam Clementina.

GUERNSEY HEIFERS TWO YEARS OLD.

L. W. Ledyard, Cazenovia, N. Y., first prize, $30; Roanoke, orange, fawn and white, bred by Silas Betts, Camden, N. J., calved February 25, 1879, sire Albemarle 56, dam Jenny by Romeo 40, gr. d. Nellie, imported.

A. S. Shimer, Redington, Penn., second prize, $15; Mertie, orange, fawn and white, bred by Thomas M. Harvey & Son, West Grove, Penn., calved November 9, 1878, sire Napoleon 58, dam Nancy 2nd by Sir Champion 38, gr. d. Nancy, imported.

GUERNSEY HEIFERS ONE YEAR OLD.

L. W. Ledyard, Cazenovia, N. Y., first prize, $20; Ontiora, red, fawn and white, bred by Le Grand B. Cannon, Burlington, Vt., calved May 6, 1880, sire Clover 101, dam Maggie, imported.

A. S. Shimer, Redington, Penn., second prize, $10; Peach, white and lemon fawn, bred by Thomas M. Harvey & Son, West Grove, Penn., calved November 29, 1879, sire Gypsey Boy 129, dam Nancy 3rd by Sir Champion 38, gr. d. Nancy, imported.

GUERNSEY HEIFER CALVES OVER FIVE MONTHS OLD.

L. W. Ledyard, Cazenovia, N. Y., first prize, $10; Fern Leaf, orange, fawn and white, bred by exhibitor, calved January 13, 1881, sire Fernwood 190, dam Kathleen, imported.

MILCH COWS OF ANY BREED.

L. W. Ledyard, Cazenovia, N. Y., first prize, $30; Guernsey cow Elegante, orange fawn and white, bred by S. Le Pelley, in Guernsey, calved spring of 1875, sire Excelsior 1st, dam Elegante.

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Smiths & Powell, Syracuse, N. Y., second prize, $15; Holstein cow Lady of the Lake, black and white, bred by C. Koning, Beemster, North Holland, calved March 30, 1878.

OXEN, STEERS AND FAT CATTLE — FAT STEERS UNDER FOUR YEARS OLD.

John Merryman, Hayfields, Md., first prize, $30; Excelsior (Hereford), red with white face, bred by exhibitor, calved January 17, 1880, sire Illinois (5395), dam Queen of Athens by Sir Richard 2nd (4984), gr. d. Jennie Clarke by Admiral (2375).

Benjamin Fellows, Clifton, N. Y., second prize, $15; grade shorthorn, red and white, 3 years.

FAT COWS OVER FOUR YEARS OLD.

John Merryman, Hayfields, Md., first prize, $30; Giantess (Hereford), red with white face, bred by John Henry Arkwright, Hampton Green, Herefordshire, calved August 26, 1868, sire Sir Oliver 2nd (1733), dam Gay Lass by Riff-Raff (1052), gr. d. Gaily by Quicksilver 2nd.

HORSES.

BREEDING AND GROWING STOCK

Special prize for the Best Draught or Agricultural Stallion of any Age or Breed.

Smiths & Powell, Syracuse, N. Y., special prize, $100; The Brown Glancer, brown, 17, five years, sire What's Wanted (913), dam Young Jean by Brown Glancer (115).

CLYDESDALES AND THEIR CROSSES — STALLIONS OVER FOUR YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $50; The Brown Glancer, brown, 17, five years, sire What's Wanted (913), dam Young Jean by Brown Glancer (115).

Smiths & Powell, Syracuse, N. Y., second prize, $25; Prince of Blacklaw, bay, 17, four years, sire Prince Edward of Wales (1255), dam Maggie Flockhart by Young Lord Haddo (902).

STALLIONS THREE YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $40; Young Victor, black, 17.1½, sire Victor, imported, dam Rosa by England's Glory, gr. d. by Cumberland, imported.

Phil Hubbard, Caton, N. Y., second prize, $20; King of the East 2nd, dark bay, 15.3, bred by Smiths & Powell, Syracuse, N. Y., sire King of the East, dam May by Campsie Jock, gr. d. by Jack's Alive.

STALLIONS TWO YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $30; Gladstone, bay, sire Ontario Chief, imported, dam by Champion, gr. d. by Captain Watt.

Smiths & Powell, Syracuse, N. Y., second prize, $15; Robert Bruce, bay, sire Scotchman, dam Lady Wallace, imported by Pope (593), gr. d. by Old Campsie (119)

STALLIONS ONE YEAR OLD.

R. J. Stilwell, Jackson, Penn., first prize, $20; iron gray.

C. Schobey, Union Springs, N. Y., second prize, $10; dark bay, sire Young Mosstrooper, dam by St. Lawrence, gr. d. by Nottingham's Norman.

MARES OVER FOUR YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $50; Birdie, bay, five years, sire Straven Collin, imported, dam by Tintock, gr. d. by Robin Hood.

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P. R. Anderson, Rush, N. Y., second prize, $25; Lucy, bay, five years, bred by Isaac Griffin, Brampton, Ont., sire Young Conqueror, dam by Wiseman's Wonder.

FILLIES TWO YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $30; Bess, gray, sire King of the East (1460), dam by Henderson Clydesdale, gr. d. by Peck's Messenger.

J. A. Roy, Wells, Penn., second prize, $15.

FILLIES ONE YEAR OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $20; Highland Belle, bay, sire Ontario Chief, imported, dam Queen of Scots by Canonbie (1407), gr. d. by Old Netherby (1494).

PERCHERONS AND THEIR CROSSES — STALLIONS OVER FOUR YEARS OLD.

John W. Akin, Scipio, N. Y., first prize, $50; Duke De Chartres, dapple gray, 16.1, seven years, sire Duke De Chartres, imported, dam by Rollon.

E. A. Cotrell, Andover, N. Y., second prize, $25; Napier, gray, 15½, four years, bred by Daniel Dunham, Wayne, Ill., sire Success 452, dam by French Emperor 203, gr. d. by Sipe's Sampson.

STALLIONS THREE YEARS OLD.

Philip Tubbs, Osceola, Penn., first prize, $40; bay, 16, sire imported Valiant.

A. S. Worden, Ulysses, N. Y., second prize, $20; General Kearney, iron gray, 15½, three years, sire Valiant.

STALLIONS TWO YEARS OLD.

Charles Eberenz, Wellsboro, Penn., first prize, $30; Success, bay, bred by exhibitor, sire Valiant, dam Fanny.

Henry Tubbs, Osceola, Penn., second prize, $15; Clark, dapple gray, 14½, sire imported Valiant.

STALLIONS ONE YEAR OLD.

E. A. Cotrell, Andover, N. Y., first prize, $20; Leo, gray, bred by exhibitor, sire Valiant 471, dam by Young Ethan Allen, gr. d. by Gray Norman.

John W. Akin, Scipio, N. Y., second prize, $10; Day-ce-Day, dark gray, sire Success, dam by French Emperor.

MARES OVER FOUR YEARS OLD.

Howard G. White, Syracuse, N. Y., first prize, $50; Chatton, gray, 16, five years, bred by Goupil Edru, Nogent-le-Rotrou, France, imported by exhibitor, sire Le Cœur Joly, dam Pauline.

Howard G. White, Syracuse, N. Y., second prize, $25; Rustique, gray, 16½, four years, bred by H. Guibert, Nogent-le-Rotrou, France, imported by exhibitor, sire Margot, dam Rustique.

FILLIES THREE YEARS OLD.

John W. Akin, Scipio, N. Y., first prize, $40; gray, 15½, sire Coco, dam by Dunham's Old Success.

Charles Bulkley, Osceola, Penn., second prize, $20; gray, 15, foaled May 28, 1878, sire imported Valiant.

FILLIES TWO YEARS OLD.

Henry Tubbs, Osceola, Penn., first prize, $30; Laura, gray, 15, foaled April 21, 1879, sire imported Valiant.

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Nelson D. Davis, Caton, N. Y., second prize, $15; Addie, light gray, 14¼, bred by exhibitor, sire Buster, dam Hattie by imported Superior.

FILLIES ONE YEAR OLD.

John W. Akin, Scipio, N. Y., first prize, $20; Minnie B., black, sire Pride of Cayuga, dam by Toronto Chief.

THOROUGHBREDS AND THEIR CROSSES—INCLUDING MESSENGERS OF ALL BRANCHES, CLAYS, MORGANS, COACHERS AND ALL FAMILIES FOUNDED UPON OR MORE OR LESS IMPROVED BY ENGLISH OR EASTERN BLOOD.

SPECIAL PRIZE FOR THE BEST STALLION OF ANY AGE.

Wolcott Van de Bogart, Batavia, N. Y., special prize, $150; Blue Danube, bay, 16, bred at Woodburn Farm, Ky., sire Woodford Mambrino, dam Cracovienne by Alexander's Abdallah, gr. d. by Cracker, son of Boston.

STALLIONS OVER FIVE YEARS OLD.

Erastus Corning, Albany, N. Y., first prize, $70; Vulcan, black, 16¼, six years, bred by exhibitor, sire Henry Clay, dam Julia by Long Island Black Hawk.

N. B. Mann, Mannsville, N. Y., second prize, $35; William Rysdyk, bay, 15.3, five years, bred by Captain Tyler, sire David Bonner, dam Babe by Tippoo.

STALLIONS FOUR YEARS OLD.

Wolcott Van de Bogart, Batavia, N. Y., first prize, $60; Blue Danube, bay, 16, bred at Woodburn Farm, Ky., sire Woodford Mambrino, dam Cracovienne by Alexander's Abdallah, gr. d. by Cracker, son of Boston

Erastus Corning, Albany, N. Y., second prize, $30; Shawmut, bay, 15.3, bred by Edwin Thorne, Millbrook, N. Y., sire Henry Clay, dam Heroine by Rysdyk's Hambletonian, gr. d. Lady Patriot by Patriot.

STALLIONS THREE YEARS OLD.

Allen Scoville, Chittenango, N. Y., first prize, $50; Wallkill, Jr., bay, 15¼, bred by exhibitor, sire Walkill.

G. McNaught, Granville Summit, Penn., second prize, $25; Hopeful, black roan, 15.3, sire Bradford Boy, dam by Seely's Black Hawk.

STALLIONS TWO YEARS OLD.

H. M. Little, Macedon, N. Y., first prize, $40; Thornwood, bay, bred by H. M. Bugher, Woodlawn Farm, Glendale, Ohio, sire Woodlawn by Hero of Thorndale, dam Mag Strader by Mambrino Clay, son of Kentucky Clay, gr. d. Susan Loder, by Daniel Boone, son of Tom Crowder.

Alden Goldsmith, Washingtonville, N. Y., second prize, $20; Edwards, bay, bred by exhibitor, sire Volunteer, dam by Hammond (son of Potter's Clay), gr. d. by American Star, g. gr. d. by Bertrand.

STALLIONS ONE YEAR OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $30; Chancellor, brown, sire Reveler, dam Ambra by Bellfounder (Rysdyk's), gr. d. Clip by Bellfounder (Latourette's).

A. F. Barnes, Farmington, N. Y., second prize, $15; light chestnut, bred by exhibitor, foaled September 2, 1880, sire Tremont, dam Flora by Long Island, gr. d. by Nimrod.

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MARES OVER FIVE YEARS OLD.

P. R. Anderson, Rush, N. Y., first prize, $60; Martha, gray, 16.2, nine years, bred by Hugh Hall, Philadelphia, Penn., sire Messenger Duroc, dam an Arabian mare, imported by Mr. Hall.

Henry Kariger, Perry, N. Y., second prize, $30; bay, nine years, sire Almont.

FILLIES FOUR YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $50; Mayflower, chestnut, sire Lysander, dam Lady Stark by imported Consternation.

H. M. Little, Macedon, N. Y., second prize, $25; Ella Rysdyk, bay, 16.2½, bred by Ira H. Coleman, Sheldrake, N. Y., sire William M. Rysdyk by Rysdyk's Hambletonian, dam Mountain Maid by Coleman's American Star, gr. d. Maud Tracy by New York Rattler, by Abdallah.

FILLIES THREE YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $40; Nymph, bay, sire Reveler, dam Black Bird by Cornell's Black Hawk.

Smiths & Powell, Syracuse, N. Y., second prize, $20; Lysander Queen, bay, sire Lysander.

FILLIES TWO YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $30; Gazelle, black, sire Reveler, dam Era by Satellite, gr. d. by a son of Consternation.

B. F. Tracy, Owego, N. Y., second prize, $15; Wanatah, chestnut, bred by A. J. Alexander, Woodburn Farm, Ky., sire Wedgewood, dam Hermosa by Edwin Forrest, gr. d. Black Rose by Tom Teemer.

FILLIES ONE YEAR OLD.

Alden Goldsmith, Washingtonville, N. Y., first prize, $20; Esther, bay, bred by exhibitor, sire Volunteer, dam by Woburn, gr. d. Lady Sears by American Star.

A. Edsall, Pine City, N. Y., second prize, $10; bay, sire Colonel Walter.

HARNESS AND SADDLE HORSES — DRAUGHT PAIRS.

Lormore & Tompkins, Elmira, N. Y., first prize, $50; black mares, 17, six and seven years.

John W. Akin, Scipio, N. Y., second prize, $25; gray 15.2, three and five years, three-quarters Percheron.

COACH PAIRS.

A. W. Patterson, Geneva, N. Y., first prize, $50; Erebus and George Wilkes, black, 16 and 17, eight and six years.

PHAETON PAIRS.

N. B. Mann, Mannsville, N. Y., first prize, $50; black, 15.2, four years, sire David Bonner.

Peck & Wickham, Tioga, Penn., second prize, $25; Lady Elliot and Tioga Girl, bay, 15.2, five years, sire Warwick Boy.

ROADSTERS

James W. Treat, Port Byron, N. Y., first prize, $30; chestnut, 15.3, seven years.

O. B. Lowell, Tioga, Penn., second prize, $15; Eustace, black, 15.2, four years, sire Warwick Boy.

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SADDLE HORSES.

H. R. C. Watson, West Farms, N. Y., first prize, $30; Olivette, brown, 15, five years, sire Jupiter Star.

PONIES (UNDER 13 HANDS), BROKEN TO HARNESS OR SADDLE.

H. R. C. Watson, West Farms, N. Y., first prize, $20; Jim, black, 11, eight years, bred from imported stock by the late William Watson, Westchester, N. Y.

Ira Balch, Mannsville, N. Y., second prize, $10; Frank, black, 12.2, three years, half Shetland.

JACKS AND MULES — JACKS.

Henry Burnett, Logan, N. Y., first prize, $30; dark brown, 14, five years, bred in Kansas.

Harvey Tift, Pine Valley, N. Y., second prize, $15; Spanish, 14, eleven years.

SHEEP, SWINE AND POULTRY.

LONG-WOOLED SHEEP — LEICESTERS — RAMS OVER TWO YEARS OLD.

W. L. & W. Rutherford, Waddington, N. Y., first prize, $20.

RAM LAMBS.

W. L. & W. Rutherford, Waddington, N. Y., first prize, $10.

PENS OF EWES OVER TWO YEARS OLD.

W. L. & W. Rutherford, Waddington, N. Y., first prize, $20.

PENS OF YEARLING EWES.

W. L. & W. Rutherford, Waddington, N. Y., first prize, $20.

PENS OF EWE LAMBS.

W. L. & W. Rutherford, Waddington, N. Y., first prize, $10.

COTSWOLDS — RAMS OVER TWO YEARS OLD.

F. S. Peer, East Palmyra, N. Y., first prize, $20; Top Knot, four years, bred by Charles Barton, Fifield, England.

George Ingersoll, Charleston, N. Y., second prize, $10; bred by T. L. Miller, Beecher, Ill.

RAMS ONE YEAR OLD.

George Ingersoll, Charleston, N. Y., first prize, $20; bred by exhibitor.

George Ingersoll, Charleston, N. Y., second prize, $10; bred by exhibitor.

RAM LAMBS.

F. S. Peer, East Palmyra, N. Y., first prize, $10; Sir Knight, bred by exhibitor.

George Ingersoll, Charleston, N. Y., second prize, $5; bred by exhibitor.

PENS OF EWES OVER TWO YEARS OLD.

George Ingersoll, Charleston, N. Y., first prize, $20; bred by exhibitor.

F. S. Peer, East Palmyra, N. Y., second prize, $10.

PENS OF YEARLING EWES.

George Ingersoll, Charleston, N. Y., first prize, $20; bred by exhibitor.

F. S. Peer, East Palmyra, N. Y., second prize, $10.

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PENS OF EWE LAMBS.

F. S. Peer, East Palmyra, N. Y., first prize, $10; bred by exhibitor.
George Ingersoll, Charleston, N. Y., second prize, $5; bred by exhibitor.

MIDDLE WOOLED SHEEP — SOUTHDOWNS — RAMS OVER TWO YEARS OLD.

D. B. Haight, Dover Plains, N. Y., first prize, $20; bred by Lord Walsingham.
J. A. Roy, Wells, Penn., second prize, $10.

RAMS ONE YEAR OLD.

D. B. Haight, Dover Plains, N. Y., first prize, $20.

RAM LAMBS.

D. B. Haight, Dover Plains, N. Y., first prize, $10.

PENS OF EWES OVER TWO YEARS OLD.

D. B. Haight, Dover Plains, N. Y., first prize, $20.

PENS OF YEARLING EWES

D. B. Haight, Dover Plains, N. Y., first prize $20.

PENS OF EWE LAMBS.

D. B. Haight, Dover Plains, N. Y., first prize, $10.

SHROPSHIRES — RAMS OVER TWO YEARS OLD.

C. D. Smead, Logan, N. Y., first prize, $20; Caractacus, three years, bred by Mr. Crawford, Perthshire, Scotland, sire Old Wellington, dam by Centurion.
C. D. Smead, Logan, N. Y., second prize, $10; Prince of Schuyler, four years, bred by Dwight Merriman, Jackson, Michigan.

RAMS ONE YEAR OLD.

Charles D. Sickler, Malta, N. Y., first prize, $20; bred by M. H. Cochrane, Canada.
Charles D. Sickler, Malta, N. Y., second prize, $10; bred by exhibitor.

RAM LAMBS.

Charles D. Sickler, Malta, N. Y., first prize, $10; bred by exhibitor.
Charles D. Sickler, Malta, N. Y., second prize, $5; bred by exhibitor.

PENS OF EWES OVER TWO YEARS OLD.

C. D. Smead, Logan, N. Y., first prize, $20; Nelly Bly, Jennie June, Beauty, all two years old and bred by exhibitor.
Charles D. Sickler, Malta, N. Y., second prize, $10; four years, bred by exhibitor.

PENS OF YEARLING EWES.

C. D. Smead, Logan, N. Y., first prize, $20; Fancy and Fashion, bred by Richard Thomas, Shrewsbury, England; Lucinda, bred by exhibitor.
Charles D. Sickler, Malta, N. Y., second prize, $10; bred by exhibitor.

PENS OF EWE LAMBS.

Charles D. Sickler, Malta, N. Y., first prize, $10, bred by exhibitor.
Charles D. Sickler, Malta, N. Y., second prize, $5, bred by exhibitor.

HAMPSHIRES — RAMS OVER TWO YEARS OLD.

Henry Metcalf, Canandaigua, N. Y., first prize, $20.

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RAMS ONE YEAR OLD.

Henry Metcalf, Canandaigua, N. Y., first prize, $20.
W. C. & L. P. Smith, Penn Yan, N. Y., second prize, $10; bred by Henry Metcalf.

RAM LAMBS.

W. C. & L. P. Smith, Penn Yan, N. Y., first prize, $10; bred by exhibitor.
Henry Metcalf, Canandaigua, N. Y., second prize, $5.

PENS OF EWES OVER TWO YEARS OLD.

Henry Metcalf, Canandaigua, N. Y., first prize, $20.

PENS OF YEARLING EWES.

Henry Metcalf, Canandaigua, N. Y., first prize, $20.

PENS OF EWE LAMBS.

Henry Metcalf, Canandaigua, N. Y., first prize, $10.

FINE WOOLLED SHEEP — MERINOS BRED FOR FINENESS OF WOOL — RAMS OVER TWO YEARS OLD.

Carl Heyne, Red Hook, N. Y., first prize, $20.
E. Townsend, Pavilion Centre, N. Y., second prize, $10.

RAMS ONE YEAR OLD.

Carl Heyne, Red Hook, N. Y., first prize, $20.
Stephen Briggs, Penn Yan, N. Y., second prize, $10.

RAM LAMBS.

Carl Heyne, Red Hook, N. Y., first prize, $10.
Carl Heyne, Red Hook, N. Y., second prize, $5.

PENS OF EWES OVER THREE YEARS OLD.

Carl Heyne, Red Hook, N. Y., first prize, $20.
E. Townsend, Pavilion Centre, N. Y., second prize, $10.

PENS OF EWES TWO YEARS OLD OR UNDER.

Carl Heyne, Red Hook, N. Y., first prize, $20.
Carl Heyne, Red Hook, N. Y., second prize, $10.

PENS OF EWE LAMBS.

Carl Heyne, Red Hook, N. Y., first prize, $10.
Carl Heyne, Red Hook, N. Y., second prize, $5.

BRED FOR WEIGHT OF FLEECE — RAMS OVER THREE YEARS OLD.

Stephen Briggs, Penn Yan, N. Y., first prize, $20.
S. B. Lusk, Batavia, N. Y., second prize, $10.

RAMS TWO YEARS OLD.

E. Townsend, Pavilion Centre, N. Y., first prize, $20.
C. D. & C. Kenyon, Centre White Creek, N. Y., second prize, $10.

RAMS ONE YEAR OLD.

Davis Cossitt, Onondaga, N. Y., first prize, $20.
E. Townsend, Pavilion Centre, N. Y., second prize, $10.

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RAM LAMBS.

Julius Stickney, Wheeler, N. Y., first prize, $10.
E. Townsend, Pavilion Centre, N. Y., second prize, $5.

PENS OF EWES OVER THREE YEARS OLD.

E. Townsend, Pavilion Centre, N. Y., first prize, $20.
S. B. Lusk, Batavia, N. Y., second prize, $10.

PENS OF EWES TWO YEARS OLD.

S. B. Lusk, Batavia, N. Y., first prize, $20.
C. D. & C. Kenyon, Centre White Creek, N. Y., second prize, $10.

PENS OF YEARLING EWES.

Davis Cossitt, Onondaga, N. Y., first prize, $20.
E. Townsend, Pavilion Centre, N. Y., second prize, $10.

PENS OF EWE LAMBS.

Davis Cossitt, Onondaga, N. Y., first prize, $10.
Julius Stickney, Wheeler, N. Y., second prize, $5.

BRED FOR LENGTH OF STAPLE — RAMS OVER TWO YEARS OLD.

E. Townsend, Pavilion Centre, N. Y., first prize, $20.
S. B. Lusk, Batavia, N. Y., second prize, $10.

RAMS ONE YEAR OLD.

E. Townsend, Pavilion Centre, N. Y., first prize, $20.
Stephen Briggs, Penn Yan, N. Y., second prize, $10.

RAM LAMBS.

Carl Heyne, Red Hook, N. Y., first prize, $10.
S. B. Lusk, Batavia, N. Y., second prize, $5.

PENS OF EWES OVER THREE YEARS OLD.

S. B. Lusk, Batavia, N. Y., first prize, $20.
E. Townsend, Pavilion Centre, N. Y., second prize, $10.

PENS OF EWES TWO YEARS OLD OR UNDER.

Davis Cossitt, Onondaga, N. Y., first prize, $20.
E. Townsend, Pavilion Centre, N. Y., second prize, $10.

PENS OF EWE LAMBS.

Julius Stickney, Wheeler, N. Y., first prize, $10.
E. Townsend, Pavilion Centre, N. Y., second prize, $5.

SWINE — LARGE WHITE BREED — BOARS OVER ONE YEAR OLD.

A. L. Thomas, Cuba, N. Y., first prize, $20.
A. Edsall, Pine City, N. Y., second prize, $10, bred by T. W. Walters.

BOARS UNDER ONE YEAR OLD.

Ezra J. Clark, Belleville, N. Y., first prize, $20, bred by exhibitor.
A. L. Thomas, Cuba, N. Y., second prize, $10.

SOWS OVER ONE YEAR OLD.

Thomas Bros., Franklinville, N. Y., first prize, $20.
A. Edsall, Pine City, N. Y., second prize, $10, bred by T. W. Walters.

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SOWS UNDER ONE YEAR OLD.

Ezra J. Clark, Belleville, N. Y., first prize, $20, bred by exhibitor.

Button Bros., Chittenango, N. Y., second prize, $10; Queen Bess, Cheshire, bred by exhibitors.

POLAND CHINA — BOARS OVER ONE YEAR OLD.

G. H. Bell, Rome, N. Y., first prize, $20; Marshland Boy, bred by D. M. Magie, sire World Beater, dam Grace.

BOARS UNDER ONE YEAR OLD.

G. H. Bell, Rome, N. Y., first prize, $20; Modoc, bred by exhibitor, sire Illinois Chief, dam Bell's Favorite.

SOWS OVER ONE YEAR OLD.

G. H. Bell, Rome, N. Y., first prize, $20; Bell's Favorite, bred by exhibitor, sire Marshland Boy, dam Spotted Beauty.

DUROC, OR RED — SOWS OVER ONE YEAR OLD.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $20.

O. Howland & Son, Auburn, N. Y., second prize, $10.

SOWS UNDER ONE YEAR OLD.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $20.

H. G. Haviland, Glen's Falls, N. Y., second prize, $10; bred by exhibitor.

SMALL WHITE BREED — BOARS OVER ONE YEAR OLD.

T. R. Proctor, Utica, N. Y., first prize, $20; Lord John, bred by H. H. Ingersoll, Owego, N. Y., sire Crown Prince, dam Princess IV by Duke of Yorkshire, imported.

Ensign & Brown, Jeddo, N. Y., second prize, $10.

BOARS UNDER ONE YEAR OLD.

T. R. Proctor, Utica, N. Y., first prize, $20; Diomede, bred by exhibitor. sire Rinaldo, dam Queen III, by King John III.

SOWS OVER ONE YEAR OLD.

T. R. Proctor, Utica, N. Y., first prize, $20; Marchioness A, bred by W. H. Cole, Clinton, N. J., sire imported King John, dam Flora, imported by W. H. Cole, Clinton, N. J.

T. R. Proctor, Utica, N. Y., second prize, $10; Queen IV, bred by H H. Ingersoll, Owego, N. Y., sire King John III, dam Queen by Duke of Yorkshire, imported.

SOWS UNDER ONE YEAR OLD.

T. R. Proctor, Utica, N. Y., first prize, $20; Sappho, bred by exhibitor, sire Rinaldo, dam Queen III by King John III.

T. R. Proctor, Utica, N. Y., second prize, $10; Sabrina, bred by exhibitor, sire Rinaldo, dam Queen III by King John III.

BERKSHIRES — BOARS OVER ONE YEAR OLD.

T. R. Proctor, Utica, N. Y., first prize, $20; Reserve, bred by John Snell's Sons, Edmonton, Ont., sire Royal Maybreeze, dam Sally Oxford, imported, by Oxford.

Oscar Larison, Lawrenceville, Penn., second prize, $10.

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BOARS UNDER ONE YEAR OLD.

Oscar Larison, Lawrenceville, Penn., first prize, $20.

T. R. Proctor, Utica, N. Y., second prize, $10; Earl of Balmoral V, bred by A. A. McArthur, Lobo, Canada, sire Norton's Smithereen, dam Rachel.

SOWS OVER ONE YEAR OLD.

T. R. Proctor, Utica, N. Y., first prize, $20; Clarice Clermont, bred by John Snell's Sons, Edmonton, Ont., sire Royal Hope, dam Constance Clermont by Windermere.

Harper W. Dewey, Sidney Centre, N. Y., second prize, $10; Sallie R. IV, one year, bred by W. C. Norton, Aldenville, Penn.

SOWS UNDER ONE YEAR OLD.

T. R. Proctor, Utica, N. Y., first prize, $20; Queen of Utica II, bred by John Snell's Sons, Edmonton, Ont., sire Royal Hope, dam Cantata by Sir D. Cardiff.

Oscar Larison, Lawrenceville, Penn., second prize, $10.

ESSEX — BOARS OVER ONE YEAR OLD.

C. W. Canfield, Athens, Penn., first prize, $20; bred by J. Harris.

George E. Harris, West Elmira, N. Y., second prize, $10; bred by J. S. Vanduzer

BOARS UNDER ONE YEAR OLD.

George Campbell, Green Landing, Penn., first prize, $20; bred by C. W. Canfield.

SOWS OVER ONE YEAR OLD.

George E. Harris, West Elmira, N. Y., first prize, $20; bred by George Coats.

SOWS UNDER ONE YEAR OLD.

C. W. Canfield, Athens, Penn., first prize, $20; bred by exhibitor.

George Campbell, Green's Landing, Penn., second prize, $10; bred by C. W. Canfield.

POULTRY.

ASIATICS—LIGHT BRAHMAS.

G. W. Chidsey, Elmira, N. Y., first prize, $5.

H. E. Chase, Gilletts, N. Y., second price, $3.

DARK BRAHMAS.

J. M. Seymour, Clark's Mills, N. Y., first prize, $5.

William H. Seeger, Colliers, N. Y., second prize, $3.

BUFF, LEMON OR CINNAMON COCHINS.

J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

PARTRIDGE OR GROUSE COCHINS.

William H. Seeger, Colliers, N. Y., first prize, $5.

G. W. Chidsey, Elmira, N. Y., second prize, $3.

WHITE COCHINS.

E. J. Eichenberg, Waverley, N. Y., first prize, $5.

C. L. G. Blessing, Slingerlands, N. Y., second prize, $3.

BLACK COCHINS.

Charles E. Dalrymple, Southport, N. Y., first prize, $5.

J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

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DORKINGS — COLORED DORKINGS.

William H. Seeger, Colliers, N. Y., first prize, $5.
J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

SILVER GRAY DORKINGS.

J. M. Seymour, Clark's Mills, N. Y., first prize, $5.

AMERICAN — DOMINIQUES.

James R. Draper, Troy, N. Y., first prize, $5.
James R. Draper, Troy, N. Y., second prize, $3.

PLYMOUTH ROCKS.

L. D. Ely, Rochester, N. Y., first prize, $5.
Charles E. Dalrymple, Southport, N. Y., second prize, $3.

HAMBURGHS — GOLDEN SPANGLED.

H. E. Chase, Gilletts, N. Y., first prize, $5.
O. Howland & Son, Auburn, N. Y., second prize, $3.

SILVER SPANGLED.

William H. Seeger, Colliers, N. Y., second prize, $3.

GOLD PENCILED.

W. H. Underwood, East Scott, N. Y., first prize, $5.

SILVER PENCILED.

O. Howland & Son, Auburn, N. Y., second prize, $3.

BLACK HAMBURGHS.

G. W. Chidsey, Elmira, N. Y., first prize, $5.
W. H. Underwood, East Scott, N. Y., second prize, $3.

WHITE HAMBURGHS.

L. D. Ely, Rochester, N. Y., second prize, $3.

SPANISH — BLACK SPANISH.

G. W. Chidsey, Elmira, N. Y., first prize $5.
O. Howland & Son, Auburn, N. Y., second prize, $3.

WHITE LEGHORNS.

L. D. Ely, Rochester, N. Y., first prize, $5.
T. R. Proctor, Utica, N. Y., second prize, $3.

BROWN LEGHORNS.

Jesse Lyon, Catharine, N. Y., first prize, $5.
Jesse Lyon, Catharine, N. Y., second prize, $3.

DOMINIQUE LEGHORNS.

O. Howland & Son, Auburn, N. Y., second prize, $3.

FRENCH — CREVE CŒURS.

J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

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HOUDANS.

Jesse Lyon, Catharine, N. Y., first prize, $5.
Jesse Lyon, Catharine, N. Y., second prize, $3.

POLISH — BLACK POLISH.

A. Edsall, Pine City, N. Y., first prize, $5.
W. H. Underwood, East Scott, N. Y., second prize, $3.

WHITE POLISH.

W. H. Underwood, East Scott, N. Y., first prize, $5.
G. W. Chidsey, Elmira, N. Y., second prize, $3.

SILVER POLISH.

O. Howland & Son, Auburn, N. Y., first prize, $5.
W. H. Underwood, East Scott, N. Y., second prize, $3.

GAMES — BLACK-BREASTED RED.

O. Howland & Son, Auburn, N. Y., first prize, $5.
O. Howland & Son, Auburn, N. Y., second prize, $3.

SILVER DUCKWING.

F. J. Webber, Syracuse, N. Y., first prize, $5.
F. J. Webber, Syracuse, N. Y., second prize, $3.

RED PILE.

John Tailby, Trumansburgh, N. Y., second prize, $3.

WHITE PILE.

O. Howland & Son Auburn, N. Y., second prize, $3..

OTHER WELL-BRED GAME

John Tailby, Trumansburgh, N. Y., second prize, $3.

BANTAMS — RED GAME.

C. W. Canfield, Athens, Pa., first prize, $5.
C. W. Canfield, Athens, Pa., second prize, $3.

RED PILE GAME.

G. W. Chidsey, Elmira, N. Y., first prize, $5.
O. Howland & Son, Auburn, N. Y., second prize, $3.

WHITE PILE GAME.

O. Howland & Son, Auburn, N. Y., first prize, $5.
F. J. Webber, Syracuse, N. Y., second prize, $3.

SILVER DUCKWING GAME.

Frank W. Gaylor, Nassau, N. Y., first prize, $5.
O. Howland & Son, Auburn, N. Y., second prize, $3.

YELLOW DUCKWING GAME.

Frank W. Gaylor, Nassau, N. Y., first prize, $5.
F. J. Webber, Syracuse, N. Y., second prize, $3.

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GOLD-LACED SEBRIGHT.

Joseph T. Meatyard, Syracuse, N. Y., first prize, $5.
Joseph T. Meatyard, Syracuse, N. Y., second prize, $3.

TURKEYS — BRONZE TURKEYS.

C. B. Strait, Sylvania, Penn., first prize, $5.
C. W. Canfield, Athens, Penn., second prize, $3.

PEARL GUINEA FOWLS.

George E. Harris, West Elmira, N. Y., first prize, $3.
George Campbell, Green's Landing, Penn., second prize, $2.

PEA FOWLS.

Andrew Bowen, Elmira, N. Y., first prize, $3.
A. S. Shimer, Redington, Penn., second prize, $2.

GEESE — TOULOUSE.

William H. Seeger, Colliers, N. Y., second prize, $3.

EMBDEN.

W. H. Underwood, East Scott, N. Y., second prize, $3.

WHITE CHINA.

William H. Seeger, Colliers, N. Y., first prize, $5.
O. Howland & Son, Auburn, N. Y., second prize, $3.

BROWN CHINA.

William H. Seeger, Colliers, N. Y., first prize, $5.
O. Howland & Son, Auburn, N. Y., second prize, $3.

WILD.

J. A. Roy, Wells, Penn., first prize, $5.
W. J. Roy, Wells, Penn., second prize, $3.

DUCKS — ROUEN.

J. M. Seymour, Clark's Mills, N. Y., first prize, $5.
H. R. C. Watson, West Farms, N. Y., second prize, $3.

AYLESBURY.

W. H. Underwood, East Scott, N. Y., second prize, $3.

CAYUGA.

J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

MUSCOVY.

L. H. Waldorf, Elmira, N. Y., first prize, $5.
L. H. Waldorf, Elmira, N. Y., second prize, $3.

PEKIN.

Washington Rowley, Corning, N. Y., first prize, $5.
Washington Rowley, Corning, N. Y., second prize, $3.

PIGEONS — CARRIERS.

George W. Chidsey, Elmira, N. Y., first prize, $3.
George W. Chidsey, Elmira, N. Y., second prize, $2.

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TUMBLERS.

George W. Chidsey, Elmira, N. Y., first prize, $3; splashed.
George W. Chidsey, Elmira, N. Y., second prize, $2; red.

TURBITS WINGED.

G. W. Chidsey, Elmira, N. Y., first prize, $3; silver winged.
Fred. S. Blessing, Slingerlands, N. Y., second prize, $2.

FANTAILS.

G. W. Chidsey, Elmira, N. Y., first prize, $3; white.
G. W. Chidsey, Elmira, N. Y., second prize, $2; black.

JACOBINS.

G. W. Chidsey, Elmira, N. Y., first prize, $3; white.
G W. Chidsey, Elmira, N. Y., second prize, $2; yellow.

BLUE ROCKS.

G. W Chidsey, Elmira, N. Y., second prize, $2.

DRAGOONS.

G. W. Chidsey, Elmira, N. Y., second prize, $2.

ANTWERPS.

Austin Anderton, Elmira, N. Y., first prize, $3.
G. W. Chidsey, Elmira, N. Y., second prize, $2; silver dun.

COLLECTIONS OF TUMBLERS.

G. W. Chidsey, Elmira, N. Y., second prize, $3.

COLLECTIONS OF FANCY PIGEONS.

G. W. Chidsey, Elmira, N. Y., first prize, $5.

COLLECTIONS OF TOY PIGEONS.

G. W. Chidsey, Elmira, N. Y., second prize, $3.

RABBITS — LOP-EARED OR MADAGASCAR — DOES OF ANY COLOR.

C. W. Canfield, Athens, Pa., first prize, $3.

SELF-COLOURED BUCKS.

G. W. Chidsey, Elmira, N. Y., second prize, $2.

BROKEN COLOURED BUCKS.

G. W. Chidsey, Elmira, N. Y., first prize, $3.

COMMON BUCKS.

George E. Harris, West Elmira, N. Y., second prize, $1.

DOES.

George E. Harris, West Elmira, N. Y., second prize, $1.

INCUBATORS IN OPERATION.

Perfect Hatcher Co., Elmira, N. Y., first prize, $10.

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IMPLEMENTS AND MACHINERY

The usual awards for implements and machinery are bronze medals, certificates of highest merit, and certificates of merit, denoted respectively by the letters B. M., C. H. M., and C. M.

E. B. Daniels & Co., Odessa, N. Y., plough sulky, $30; C. H. M.

Gregg & Co., Trumansburgh, N. Y., Osborn sulky plough, 335 pounds, $30; C. M.

The Reiner Harrow Company, Line Lexington, Penn., sulky harrow, $31.50; C. M.

Dickey & Pease, Racine, Wis. (E. A. Egelston, Albion, N. Y., general agent for New York), the A. P. Dickey fanning mills, warehouse size, $50; farm sizes, $30 and $35; C. M.

Jones of Binghamton, N. Y., hay and cattle scales; C. H. M.

M. P. Schenck, Fulton, N. Y., Schenck's patent Empire State press, and Schenck's patent apple grater; C. M.

D. W. Seeley, Albany, N. Y., Buckman and Seeley's patent hay and cotton press; silver medal.

S. B. Van Duzer, Gouverneur, N. Y., Bonanza fanning mill and grain and seed separator; C. H. M.

Chandler & Taylor, Indianapolis, Ind., farm engine, 4,200 lbs., $1,000; C. M.

Chandler & Taylor, Indianapolis, Ind., portable saw mill, 4,200 lbs., $500; C. H. M.

B. W. Payne & Sons, Corning, N. Y., thirty-horse power engine, furnishing the power in Machinery Hall; C. H. M.

Reynolds & Lang, Ithaca, N. Y., portable farm engine, cylinder 7x9 inches, weight 4,000 lbs., $975; C. H. M.

M. D. Chapin, Poultney, Vt., D. B. Wooster's Perfection creamery, various sizes, $15 to $48; C. M.

M. D. Chapin, Poultney, Vt., Richardson's Surprise barrel churn; No. 2, $9, No. 4, $12; C. M.

Moseley & Stoddard Manufacturing Co., Poultney, Vt., the Moseley cabinet creamery, four sizes, price for dairy of six cows, $25, of twelve cows, $36, etc ; C. H. M.

Moseley & Stoddard Manufacturing Co., Poultney, Vt., the Stoddard churn, four sizes, capacity 20, 25, 35 and 60 gallons, prices $10, $12, $14 and $22; C. H. M.

Vermont Machine Co., Bellows Falls, Vt., by D. W. Ford, agent, Oneonta, N. Y., the Cooley creamer, regular style No. 2, $35, No. 00, upright, $26, No. 1, Junior, $32, No. 2, elevator style, $12; C. H. M.

Joseph R. Angel, Camptown, Penn., carriage lifter or waggon jack; C. M.

W. C. Barker, Millport, N. Y., rubber bucket chain pump; C. H. M.

Blair & Fish Manufacturing Co., Springfield, Mass., the Easy lawn mower, 12 to 30 inches; C. H. M.

B. J. C. Howe, Syracuse, N. Y., by John C. Lyon, agent, Elmira, N. Y., Howe's force pumps; C. H. M.

Zalmon W. Smith, Addison, N. Y., Smith's cattle stanchion; B. M.

W. S. Brockway, Homer, N. Y., by Friendly Brothers, agents, Elmira, N. Y., platform spring waggons; C. M.

W. S. Brockway, Homer, N. Y., by Friendly Brothers, agents, Elmira, N. Y., road waggons; C. M.

E. D. Clapp Wagon Co., Auburn, N. Y., farm waggons, various sizes and weights; C. M.

Columbus Buggy Co., Columbus, Ohio, by Friendly Brothers, agents, Elmira, N. Y., side bar top buggies and phaetons; C. M.

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Cortland Wagon Co., Cortland, N. Y., farmers' waggons for four or six passengers, open, for one or two horses, platform and combination springs, $90, $105, $130; C. H. M.

Cortland Wagon Co., Cortland, N. Y., top buggies, two passengers, Brewster's spring and side bar, Timken spring and side bar and elliptic spring, $125, $130. C. H. M.

Cortland Wagon Co., Cortland, N. Y., phaetons, two and three elliptic springs, $135 and $145; C. H. M.

Davis Iron Wagon Co., Elmira, N. Y., farm and freight waggons; C. H. M.

James Ewing, Elmira, N. Y., pony phaetons; C. H. M.

Fish Brothers & Co., Racine, Wis., by Friendly Brothers, agents, Elmira, N. Y., farm and lumber waggons; C. M.

Harris & Holland, Hornellsville, N. Y., Harris' patent carriage seat, $1.25; C. M.

Milburn Wagon Co., Toledo, Ohio, farm and lumber waggons, $70 and $75; C. H. M.

Rome Spring Wagon Co., Rome, N. Y., Fitch reach platform spring waggons; C. H. M.

J. C. Seeley, Elmira, N. Y., Berkshire cabriolet carriage; C. H. M.

Short & Smith, Syracuse, N. Y., for fine display of carriages; C. H. M.

R. K. Teller, Unadilla, N. Y., Hallenbeck's patent buggy body and seat; C. H. M

W. B. Thomas, Elmira, N. Y., patent tension spring, $1.50; C. M.

C. E. Abbey, Sara Sota, Florida, exhibition, as agent of the Board of Immigration of the State of Florida, of Florida fruits and objects illustrating the natural history of the State; C. H. M.

Double Coil Spiral Spring Bed Company, Watertown, N. Y., double coil spiral bed springs; C. H. M.

Friendly Brothers, Elmira, N. Y., exhibition of carriage robes, horse clothing, saddlery, stable utensils, etc; C. H. M.

Gillett & Co., Elmira, N. Y., exhibition of augers, bits and drawing knives; C. H. M.

Johnson, Mallets & Wood, the excelsior bed fastener; C. M.

Park & Larieu, Elmira, N. Y., upright spiral spring bed, with steel spring coil coupling; C. H. M.

H. B. Rhymer, Elmira, N. Y., samples of files and rasps, file makers' cutting blocks; C. H. M.

James Smallwood, Albany, N. Y., nailing jack for boots and shoes; C. M.

FARM PRODUCE.

GRAIN, SEEDS, HOPS — GROWN IN 1881 — WHITE WINTER WHEAT.

C. B. Strait, Sylvania, Penn., first prize, $10; Clawson.

J. H. Webber, Big Flats, N. Y., second prize, $5.

RED WINTER WHEAT.

D. Freeling Beardsley, Catharine, N. Y., first prize, $10.

Oscar J. Lewis, Schodack Centre, N. Y., second prize, $5.

SPRING WHEAT.

George Campbell, Green's Landing, Penn., first prize, $10; white Russian.

Asa Elliot, West Elmira, N. Y., second prize, $5.

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WINTER RYE.

T. S. Wolcott, Athens, Penn., first prize, $10; large white.
Henry Schoonmaker, Cedar Hill, N. Y., second prize, $5; Michigan.

SPRING RYE.

Edwin Van Allen, Bethlehem Centre, N. Y., first prize, $10.
C. L. G. Blessing, Slingerlands, N. Y., second prize, $5.

WHITE OATS.

George Campbell, Green's Landing, Penn., first prize, $10; Challenge.
J. H. Webber, Big Flats, N Y., second prize, $5.

BLACK OR GRAY OATS.

George Campbell, Green's Landing, Penn., first prize, $10; Mould's Tartarian.
Henry Schoonmaker, Cedar Hill, N. Y., second prize, $5; Mould's Ennoble.

WINTER BARLEY.

C. L. G. Blessing, Slingerland's, N. Y., first prize, $10.

TWO-ROWED SPRING BARLEY.

George Chamberlain, Southport, N. Y., first prize, $10.
George Campbell, Green's Landing, Penn., second prize, $5.

FOUR-ROWED SPRING BARLEY.

George Maby, Elmira, N. Y., first prize, $10.
C. B. Strait, Sylvania, Penn., second prize, $5.

YELLOW INDIAN CORN (SHELLED).

George Chamberlain, Southport, N. Y., first prize, $10.
C. L. G. Blessing, Slingerlands, N. Y., second prize, $5.

WHITE INDIAN CORN (SHELLED).

George Chamberlain, Southport, N. Y., first prize, $10.
Fred. S. Blessing, Slingerlands, N. Y., second prize, $5.

LARGE FIELD BEANS.

C. L. G. Blessing, Slingerlands, N. Y., first prize. $10.
George Chamberlain, Southport, N. Y., second prize, $5.

SMALL FIELD BEANS.

George Chamberlain, Southport, N. Y., first prize, $10.
Fred. S. Blessing, Slingerlands, N. Y., second prize, $5.

LARGE FIELD PEAS.

Edwin Van Allen, Bethlehem Centre, N. Y., first prize, $10.
Fred. S. Blessing, Slingerlands, N. Y., second prize, $5.

SMALL FIELD PEAS.

C. L. G. Blessing, Slingerlands, N. Y., first prize, $10.
George Campbell, Green's Landing, Penn, second prize, $5; Canada.

BUCKWHEAT.

H. Schoonmaker, Cedar Hill, N. Y., first prize, $5.
Daniel M. Beers, Horseheads, N. Y., second prize, $3.

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MEDIUM CLOVER SEED.

Daniel M. Beers, Horseheads, N. Y., first prize, $5.

TIMOTHY SEED.

Daniel M. Beers, Horseheads, N. Y., first prize, $5.
J. Miller, Fredonia, N. Y., second prize, $3.

MILLET.

J. H. Webber, Big Flats, N. Y., first prize, $5
George Chamberlain, Southport, N. Y., second prize, $3.

FLAX SEED.

George Chamberlain, Southport, N. Y., first prize, $5.
Edwin Van Allen, Bethlehem Centre, N. Y., second prize, $3.

SORGHUM SEED.

Edwin Van Allen, Bethlehem Centre, N. Y., first prize, $5.
Washington Rowley, Corning, N. Y., second prize, $3.

TWENTY-FIVE SEED EARS OF YELLOW CORN (EIGHT-ROWED).

J. S. Holbert, Chemung, N. Y., first prize, $5.
Edwin Van Allen, Bethlehem Centre, N. Y., second prize, $3.

TWENTY-FIVE SEED EARS OF YELLOW CORN (TWELVE-ROWED).

George Chamberlain, Southport, N. Y., first prize, $5.
Morgan Decker, Owego, N. Y., second prize, $3.

TWENTY-FIVE SEED EARS OF WHITE CORN.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $5.
C. L. G. Blessing, Slingerlands, N. Y., second prize, $3.

TWENTY-FIVE SEED EARS OF EARLY SWEET CORN.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $5.
George Chamberlain, Southport, N. Y., second prize, $3.

TWENTY-FIVE SEED EARS OF LATE SWEET CORN.

J. S. Holbert, Chemung, N. Y., first prize, $5.
Edwin Van Allen, Bethlehem Centre, N. Y., second prize, $3.

HOPS.

William H. Seeger, Colliers, N. Y., first prize, $10.
George Maby, Elmira, N. Y., second prize, $5.

VEGETABLES — CELERY.

A. Donald, Horseheads, N. Y., first prize, $3.
George Chamberlain, Southport, N. Y., second prize, $2.

CAULIFLOWERS.

George Chamberlain, Southport, N. Y., first prize, $3.

BROCOLI.

George Chamberlain, Southport, N. Y., first prize, $3.

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CABBAGES.

Washington Rowley, Corning, N. Y., first prize, $3.
A. Donald, Horseheads, N. Y., second prize, $2.

MANGOLDS.

James Miller, Penn Yan, N. Y., first prize, $3.
George Chamberlain, Southport, N. Y., second prize, $2.

BEETS.

R. O. Colt, Babylon, N. Y., first prize, $3.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $2.

ORANGE CARROTS.

George Chamberlain, Southport, N. Y., first prize, $3.
Edwin Van Allen, Bethlehem Centre, N. Y., second prize, $2.

WHITE CARROTS.

Edwin Van Allen, Bethlehem Centre, N. Y., first prize, $3.
George Chamberlain, Southport, N. Y., second prize, $2.

PARSNIPS.

A. Donald, Horseheads, N. Y., first prize, $3.
Edwin Van Allen, Bethlehem Centre, N. Y., second prize, $2.

SALSIFY.

A. Donald, Horseheads, N. Y., first prize, $3.
Edwin Van Allen, Bethlehem Centre, N. Y., second prize, $2.

KOHL-RABI.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $3.
George Chamberlain, Southport, N. Y., second prize, $2.

ONIONS.

Washington Rowley, Corning, N. Y., first prize, $3.
A. Donald, Horseheads, N. Y., second prize, $2.

TOMATOS.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $3.
Jackson Goldsmith, Elmira, N. Y., second prize, $2.

EGG PLANT.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $3.
George Chamberlain, Southport, N. Y., second prize, $2.

GARDEN BEANS.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $3.
Fred. S. Blessing, Slingerlands, N. Y., second prize, $2.

PEPPERS.

A. Donald, Horseheads, N. Y., first prize, $3.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $2.

SQUASHES.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $3.
George Chamberlain, Southport, N. Y., second prize, $2.

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PUMPKINS.

Fred S. Blessing, Slingerlands, N. Y., first prize, $3.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $2.

SWEET POTATOES.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $3.
George Chamberlain, Southport, N. Y., second prize, $2.

POTATOES — EXHIBITIONS OF EARLY VARIETIES.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $10.
A. S. Johnson, Chili Station, N. Y., second prize, $5.

POTATOES — EXHIBITIONS OF LATE VARIETIES.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $10.
A. S. Johnson, Chili Station, N. Y., second prize, $5.

POTATOES — EXHIBITIONS OF STOCK-FEEDING VARIETIES.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $10.
C. L. G. Blessing, Slingerlands, N. Y., second prize, $5.

COLLECTIONS OF VEGETABLES.

R. O. Colt, Babylon, N. Y., first prize, $25.

BUTTER.

Special prize for six packages of not less than thirty pounds each, made in the same creamery or private dairy.

A. F. Risley, New York Mills, N. Y., prize, $50.

SAMPLES MADE IN JUNE — CREAMERY.

J. S. Holbert, Chemung, N. Y., third prize, $10.

SAMPLES MADE AT ANY TIME — CREAMERY.

Wheeler & Rundle, Horseheads, N. Y., first prize, $30.
A. F. Risley, New York Mills, N. Y., second prize, $20.
J. S. Holbert, Chemung, N. Y., third prize, $10.

SAMPLES MADE IN JUNE — PRIVATE DAIRY.

Aaron Ford, West Davenport, N. Y., third prize, $10.

SAMPLES MADE AT ANY TIME — PRIVATE DAIRY.

Andrew C. Biggar, Pepacton, N. Y., first prize, $30.
Hattie T. Breed, Big Flats, N. Y., second prize, $20.
David Stratton, West Elmira, N. Y., third prize, $10.

MOULDS OR ROLLS.

S. B. Brees, Southport, N. Y., first prize, $10.
L. W. Ledyard, Cazenovia, N. Y., second prize, $5.

CHEESE — AMERICAN CHEESE OVER ONE YEAR OLD.

G. A. Bonfoy, Princetown, N. Y., second prize, $20.
Mrs. J. A. Henry, Reed's corners, N. Y., third prize, $10.

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AMERICAN CHEESE LESS THAN ONE YEAR OLD.

G. A. Bonfoy, Princetown, N. Y., second prize, $10.
C. A. Miller, Laona, N. Y., third prize, $10.

BREAD, SUGAR, ETC.—WHEATEN BREAD.

Mrs. G. E. Harris, Elmira, N. Y., first prize, $5.
Edwin Van Allen, Bethlehem Centre, N. Y., second prize, $3.

RYE BREAD.

Edwin Van Allen, Bethlehem Centre, N. Y., first prize, $5.
M. H. Tennant, Rome, N. Y., second prize, $3.

INDIAN, OR RYE AND INDIAN BREAD.

M. H. Tennant, Rome, N. Y., first prize, $5.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $3.

MAPLE SUGAR.

William F. Ford, West Davenport, N. Y., first prize, $5.

MAPLE SYRUP.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $5.
M H. Tennant, Rome, N. Y., second prize, $3.

PRESERVED FRUITS.

Oscar J. Lewis, Schodack, N. Y., first prize, $5.
Edwin Van Allen, Bethlehem Centre, N. Y., second prize, $3.

PICKLES.

Mrs. G. N. Westeen, Albany, N. Y., first prize, $5.
C. L. G. Blessing, Slingerlands, N. Y., second prize, $3.

DRIED APPLES.

Mrs. George C. Wickham, Havana, N. Y., first prize, $5.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $3.

DRIED PEACHES.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $5.
Mrs. G. C. Wickham, Havana, N. Y., second prize, $3.

DRIED WHORTLEBERRIES.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $5.
Mrs. C. Berk, State Line, Penn, second prize, $3.

DRIED RASPBERRIES.

Mrs. J. T. Griffiths, Millport, N. Y., first prize, $5.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $3.

BOX HONEY.

C. W. Canfield, Athens, Penn., first prize, $5.
P. Miller, Fredonia, N. Y., second prize, $3.

EXTRACTED OR STRAINED HONEY.

M. H. Tennant, Rome, N. Y., first prize, $5.
C. W. Canfield, Athens, Penn., second prize, $3

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DOMESTIC MANUFACTURES.

WOOLEN BLANKETS.

Mrs. C. Berk, State Line, Penn., first prize, $5.

ALL WOOL HORSE BLANKETS.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $5.
Mrs. George H. Humphrey, Breesport, N. Y., second prize, $3.

WOOLEN CLOTH.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $5.
Mrs. C. M. Stone, Blossvale, N. Y., second prize, $3.

WOOLEN FLANNEL.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $5.
Mrs. W. H. Graves, Blossvale, N. Y., second prize, $3.

WOOLEN AND COTTON FLANNEL.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $5.
Mrs. George H. Humphrey, Breesport, N. Y., second prize, $3.

LINSEY WOOLSEY.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $5.
Mrs. W. H. Graves, Blossvale, N. Y., second prize, $3.

COTTON AND WOOL KERSEY.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $5.

WOOLEN CARPET.

Mrs. C. Berk, State Line, Penn., first prize, $5.

RAG CARPET.

Jane L. Williams, East Elmira, N. Y., first prize, $5.
Mrs. C. Berk, State Line, Penn., second prize, $3.

HEARTH RUGS.

Mrs. Roswell R. Moss, Elmira, N. Y., first prize, $5.
Mrs. W. B. Sayre, Horseheads, N. Y., second prize, $3.

DOUBLE CARPET COVERLETS.

Mrs. C. Berk, State Line, Penn., first prize, $5.
Mrs. C. M. Stone, Blossvale, N. Y., second prize, $3.

LINEN DIAPER.

Mrs. R. M. Lewis, Mott's Corners, N. Y., first prize, $5.
Miss Polly A. Nelson, Mott's Corners, N. Y., second prize, $3.

LINEN KERSEY.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $5.

TOW CLOTH.

Mrs. R. M. Lewis, Mott's Corners, N. Y., first prize, $5.
Mrs. W. H. Graves, Blossvale, N. Y., second prize, $3.

LINEN BAGGING.

Mrs. C. M. Stone, Blossvale, N. Y., first prize, $5.

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KNIT BED SPREADS.

Emma L. Van Derlip, Horseheads. N. Y., first prize, $3.
Mrs. J. W. Hathorn, Elmira, N. Y., second prize, $2.

WHITE WORKED OR QUILTED BED SPREADS.

Mrs. J. W. Hathorn, Elmira, N. Y., first prize, $3.
Mrs. A. Shaw, Elmira, N. Y., second prize, $2.

BALMORAL PETTICOATS.

Mrs. C. M Stone, Blossvale, N. Y., first prize, $3.
Mrs. W. H. Graves, Blossvale, N. Y., second prize, $2.

WOOLEN KNIT STOCKINGS.

M. H. Tennant, Rome, N. Y., first prize, $3.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $2.

WORSTED KNIT STOCKINGS.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $3.
M. H. Tennant, Rome, N. Y., second prize, $2.

WOOLEN KNIT MITTENS.

M. H. Tennant, Rome, N. Y., first prize, $3.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $2.

WOOLEN FRINGE MITTENS.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $3.
Mrs. Seth Bonfoy, West Winfield, N. Y., second prize, $2.

WOOLEN SOCKS BY GIRLS UNDER TWELVE.

Miss Dora Balch, Horseheads, N. Y., first prize, $3.

WOOLEN YARN BY GIRLS UNDER TWELVE.

Miss Dora Balch, Horseheads, N. Y., first prize, $3.

LINEN OR COTTON KNIT STOCKINGS.

C. L. Turner, Horseheads, N. Y., first prize, $3; linen.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $2.

LINEN SEWING THREAD.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $3.

EXTRA AWARDS.

L. Belle Breed, Big Flats, N. Y., $2; exhibition of tidies.
Mrs. E. Davis, $3; rug and cushion.
Mrs. J. Greener, Elmira, N. Y., $3; exhibition of canvas work.
Mrs. J. W. Hathorn, Elmira, N. Y., $5; six silk quilted bed spreads.
Mrs. Nye, Cayutaville, N. Y., $2; worsted wreath.
Mrs. Houghtailing, $2; worsted wreath.
Thomas Parkinson, Elmira, N. Y., $3; satin couch cushion.
Mrs. G. S. Whitlock, Elmira, N. Y., $3; lambrequins, etc.
Mrs. G. C. Wickham, Elmira, N. Y., $2; lambrequins, etc.

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FLOWERS.

PROFESSIONAL LIST — EXHIBITIONS OF CUT FLOWERS.

Mrs. H. D. Wells, Elmira, N. Y., first prize $10.
Grove P. Rawson, Elmira, N. Y., second prize, $5.

COLLECTIONS OF DAHLIAS.

James Vick, Rochester, N. Y., first prize, $6.

TWENTY-FOUR DAHLIAS.

James Vick, Rochester, N. Y., first prize, $5.

TWELVE DAHLIAS.

James Vick, Rochester, N. Y., first prize, $3.

AMERICAN SEEDLING DAHLIAS.

James Vick, Rochester, N. Y., prize, $1.

COLLECTIONS OF ANNUAL PHLOXES.

James Vick, Rochester, N. Y., first prize, $5.
Mrs. H. D. Wells, Elmira, N. Y., second prize, $3.

SEEDLING PHLOXES.

James Vick, Rochester, N. Y., prize, $1.

COLLECTIONS OF VERBENAS.

Grove P. Rawson, Elmira, N. Y., first prize, $5.
Mrs. H. D. Wells, Elmira, N. Y., second prize, $3.

TWELVE VARIETIES OF VERBENAS.

James Vick, Rochester, N. Y., first prize, $3.
Grove P. Rawson, Elmira, N. Y., second prize, $2.

AMERICAN SEEDLING VERBENAS.

James Vick, Rochester, N. Y., prize, $1.

COLLECTIONS OF ASTERS.

James Vick, Rochester, N. Y., first prize, $3.
Mrs. H. D. Wells, Elmira, N. Y., second prize, $2.

COLLECTIONS OF CELOSIAS.

James Vick, Rochester, N. Y., first prize, $3.

COLLECTIONS OF LILIES.

James Vick, Rochester, N. Y., first prize, $3.
Mrs. H. D. Wells, Elmira, N. Y., second prize, $2.

COLLECTIONS OF PANSIES.

Mrs. H. D. Wells, Elmira, N. Y., first prize, $3.

TEN WEEK STOCKS.

James Vick, Rochester, N. Y., first prize, $3.

COLLECTIONS OF GLADIOLUS.

James Vick, Rochester, N. Y., first prize, $3.
Grove P. Rawson, Elmira, N. Y., second prize, $2.

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TWELVE VARIETIES OF GLADIOLUS.

James Vick, Rochester, N. Y., first prize, $2.

AMATEUR LIST — EXHIBITIONS OF CUT FLOWERS.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $10.
S. S. Mathews, West Elmira, second prize, $5.

COLLECTIONS OF DAHLIAS.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $6.
Mrs. J. T. Griffiths, Millport, N. Y., second prize, $3.

SIX VARIETIES OF DAHLIAS.

Mrs. J. T. Griffiths, Millport, N. Y., first prize, $2.

COLLECTIONS OF ROSES.

Mrs. J. T. Griffiths, Millport, N. Y., first prize, $6.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $3.

SIX VARIETIES OF ROSES.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $2.
Mrs. J. T. Griffiths, Millport, N. Y., second prize, $1.

COLLECTIONS OF VERBENAS.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $5.
Mrs. Jackson Goldsmith, Elmira, N. Y., second prize, $3.

COLLECTIONS OF PHLOXES.

Miss L P. Tennant, Stanwix, N. Y., first prize, $5.
Mrs. J. T. Griffiths, Millport, N. Y., second prize, $3.

PERENNIAL PHLOXES.

Carl Mussey, Havana, first prize, $2.

COLLECTIONS OF ASTERS.

Mrs. J. T. Griffiths, Millport, N. Y., first prize, $3.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $2.

COLLECTIONS OF PANSIES.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $3.
Mrs. J. T. Griffiths, Millport, N. Y., second prize, $2.

TEN WEEK STOCKS.

Mrs. J. T. Griffiths, Millport, N. Y., first prize, $3.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $2.

COLLECTIONS OF GLADIOLUS.

Edwin Van Allen, Bethlehem Centre, N. Y., first prize, $3.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $2.

EVERLASTING FLOWERS.

Mrs. J. T. Griffiths, Millport, N. Y., first prize, $3.

GENERAL LIST, OPEN TO ALL COMPETITORS — POT PLANTS (TWENTY SPECIMENS.)

Grove P. Rawson, Elmira, N. Y., first prize, $10.
Mrs. H. D. Wells, Elmira, N. Y., second prize, $5.

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POT PLANTS (TEN SPECIMENS).

Grove P. Rawson, Elmira, N. Y., first prize, $5.
Mrs. H. D. Wells, Elmira, N. Y., second prize, $3.

SIX VARIETIES OF VARIEGATED LEAVED PLANTS.

Grove P. Rawson, Elmira, N. Y., first prize, $5.
Mrs. H. D. Wells, Elmira, N. Y., second prize, $3.

SINGLE VARIEGATED LEAVED PLANTS.

Mrs. J. T. Griffiths, Millport, N. Y., prize, $2.

FUSCHIAS.

Grove P. Rawson, Elmira, N. Y., prize, $2.

TWELVE ZONAL PELARGONIUMS (SINGLE).

Grove P. Rawson, Elmira, N. Y., first prize, $5.

ONE ZONAL PELARGONIUM (SINGLE).

Miss Jennie Hughson, Big Flats, N. Y., prize, $2.

SIX ZONAL PELARGONIUMS (DOUBLE).

Mrs. H. D. Wells, Elmira, N. Y., first prize, $3.
Grove P. Rawson, Elmira, N. Y., second prize, $2.

ONE ZONAL PELARGONIUM (DOUBLE).

Grove P. Rawson, Elmira, N. Y., prize, $2.

SUCCULENTS, OTHER THAN CACTI.

Grove P. Rawson, Elmira, N. Y., first prize, $5.
Mrs. H. D. Wells, Elmira, N. Y., second prize, $3.

PAIRS OF HAND BOUQUETS.

Grove P. Rawson, Elmira, N. Y., first prize, $5.
Mrs. H. D. Wells, Elmira, N. Y., second prize, $3.

PAIRS OF TABLE BOUQUETS.

Grove P. Rawson, Elmira, N. Y., first prize, $5.
Ada C. Groom, Horseheads, N. Y., second prize, $3.

BUTTON-HOLE BOUQUETS.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $3.
Edwin Van Allen, Bethlehem Centre, N. Y., second prize, $2.

BASKETS OF FLOWERS.

Grove P. Rawson, Elmira, N. Y., first prize, $5.
Mrs. H. D. Wells, Elmira, N. Y., second prize, $3.

PAIRS OF HANGING BASKETS.

Grove P. Rawson, Elmira, N. Y., first prize, $3.
Mrs. H. D. Wells, Elmira, N. Y., second prize, $2.

DINNER TABLE DESIGNS.

Mrs. H. D. Wells, Elmira, N. Y., first prize, $5.
Grove P. Rawson, Elmira, N. Y., second prize, $3.

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RUSTIC STANDS WITH PLANTS.

Grove P. Rawson, Elmira, N. Y., first prize, $5.
Ada C. Groom, Horseheads, N. Y., second prize, $3.

NEW PLANTS AND FLOWERS.

Mrs. H. D. Wells, Elmira, N. Y., first prize, $5.
Grove P. Rawson, Elmira, N. Y., second prize, $3.

FRUITS.

PROFESSIONAL LIST — TWENTY VARIETIES OF APPLES.

George C. Wickham, Havana, N. Y., second prize, $5.

TEN VARIETIES OF APPLES.

George C. Wickham, Havana, N. Y., first prize, $5.

COLLECTIONS OF PEARS.

Ellwanger & Barry, Rochester, N. Y., first prize $15.

TWENTY VARIETIES OF PEARS.

Ellwanger & Barry, Rochester, N. Y., first prize, $10.
O. H. Budd, Hector, N. Y., second prize, $5.

TEN VARIETIES OF PEARS.

O. H. Budd, Hector, N. Y., second prize, $3.

SIX VARIETIES OF PEACHES.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.
G. C. Wickham, Havana, N. Y., second prize, $3.

ONE VARIETY OF PEACHES.

G. C. Wickham, Havana, N. Y., first prize, $2.

COLLECTIONS OF PLUMS.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.

FIVE VARIETIES OF PLUMS.

Ellwanger & Barry, Rochester, N. Y., first prize, $3.
O. H. Budd, Hector, N. Y., second prize, $2.

ONE VARIETY OF PLUMS.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.
O. H. Budd, Hector, N. Y., second prize, $1.

QUINCES.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

NATIVE GRAPES — TEN VARIETIES OF GRAPES.

Ellwanger & Barry, Rochester, N. Y., first prize, $10.
O. H. Budd, Hector, N. Y., second prize, $5.

FIVE VARIETIES OF GRAPES.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.
O. H. Budd, Hector, N. Y., second prize, $3.

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AMATEUR LIST — COLLECTIONS OF APPLES.

John Van Dorn, Ithaca, N. Y., first prize, $10.

TEN VARIETIES OF APPLES.

John Van Dorn, Ithaca, N. Y., first prize, $5.
Ira B. Crandall, Alfred Centre, N. Y., second prize, $3.

COLLECTIONS OF PEARS.

Mrs. James Sproat, Rochester, N. Y., first prize, $5.
A. S. Shimer, Redington, Penn., second prize, $3.

FIVE VARIETIES OF PEARS.

Mrs. James Sproat, Rochester, N. Y., first prize, $3.
G. E. Adriance, Hector, N. Y., second prize, $2.

COLLECTIONS OF PEACHES.

A. S. Shimer, Redington, Penn., second prize, $2.

ONE VARIETY OF PEACHES.

John Van Dorn, Ithaca, N. Y., first prize, $2.
S. S. Mathews, West Elmira, second prize, $1.

THREE VARIETIES OF PLUMS.

Edwin Van Allen, Bethlehem Centre, N. Y., second prize, $1.

ONE VARIETY OF PLUMS.

Mrs. E. Green, Elmira, N. Y., first prize, $1.

QUINCES.

Mrs. James Sproat, Rochester, N. Y., first prize, $2.

NATIVE GRAPES — TEN VARIETIES OF GRAPES.

G. E Adriance, Hector, N Y., first prize, $6.
Carl Mussey, Havana, second prize, $3.

FIVE VARIETIES OF GRAPES.

G. E. Adriance, Hector, N. Y., first prize, $3.

FOREIGN GRAPES — FIVE VARIETIES OF FOREIGN GRAPES.

Ralph Royal, Elmira, N. Y., first prize, $6.

ONE VARIETY OF FOREIGN GRAPES.

Ralph Royal, Elmira, N. Y., first prize, $3.

FRUITS — SINGLE DISHES — OPEN TO ALL — APPLES — FALL PIPPIN.

Edwin Van Allen, Bethlehem Centre, N. Y., prize, $2.

TWENTY-OUNCE.

John Van Dorn, Ithaca, N. Y., prize, $2.

PEARS — BEURRE D'ANJOU.

Ellwanger & Barry, Rochester, N. Y., prize, $2.

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FEURRE CLAIRGEAU.

Ellwanger & Barry, Rochester, N. Y., prize, $2.

BEURRE BOSC.

G. E. Adriance, Hector, N. Y., prize, $2.

AWARDS

At the Forty-second Annual Cattle Show and Fair of the New York State Agricultural Society, held at Utica, September 25 to 29, 1882.

CATTLE.

SHORTHORNS — SHORTHORN HERD PRIZE.

Daniel B. Haight, Dover Plains, N. Y., large gold medal.

Bull, Waterloo 3rd, red, bred by exhibitor, calved May 25, 1880, sire Oneida Prince 27359, dam Constance of Lyndale 8th by 7th Lord Oxford 17586, gr. d. Constance of Lyndale 2nd by Scotsman 27435.

Cow, Constance of Lyndale 8th, roan, bred by W. S. King, Minneapolis, Minn., calved March 10, 1876, sire 7th Lord Oxford 17586, dam Constance of Lyndale 2nd by Scotsman (27435), gr. d. Constance 6th by 7th Duke of Airdrie (23718).

Cow, Constance of Brookdale, roan, bred by W. S. King, Minneapolis, Minn., calved March 5, 1877, sire Wildeyes Duke 21325 dam Constance 6th by 7th Duke of Airdrie (23718), gr. d. Constance 3rd by Clifton Duke (23580).

Cow, Constance of Brookdale 4th, roan, bred by exhibitor, calved September 24, 1878, sire Oneida Prince 27359, dam Constance 6th by 7th Duke of Airdrie (23718), gr. d. Constance 3rd by Clifton Duke (23580).

Heifer, Constance of Brookdale 7th, roan, bred by exhibitor; calved December 16, 1879, sire Baron of Brookdale 28511, dam Constance 5th by Earl of Seaham 8077, gr. d. Constance 3rd by Clifton Duke (23580).

SHORTHORN BULLS OVER THREE YEARS OLD.

Daniel C. Munro, Elbridge, N. Y., first prize, $50; Earl of Clifton, red, bred by Charles M. Lansing, Niagara, Canada; calved May 17, 1879, sire Baron Percy 28549, dam Countess of Belvoir by 22nd Duke of Airdrie 16695, gr. d. Campaspe 2nd by 4th Grand Duke of Oxford 5734.

M. B. Ritter, Waterloo, N. Y., second prize, $25; Prince of the River, red with a little white, bred by Charles F. Wadsworth, Geneseo, N. Y., calved August 13, 1871, sire Grand Duke 8247, dam Rosaline by Berkshire Duke 2539, gr. d. Tube rose 5th by Tornado 1040.

SHORTHORN BULLS TWO YEARS OLD.

Daniel B. Haight, Dover Plains, N. Y., first prize, $40; Waterloo 3rd, red, bred by exhibitor, calved May 25, 1880, sire Oneida Prince 27359, dam Constance of Lyndale 8th by 7th Lord Oxford 17586, gr. d. Constance of Lyndale 2nd by Scotsman 27435.

William S. Moore, Jr., Mount Upton, N. Y., second prize, $20; Waterloo, roan, bred by Daniel B. Haight, Dover Plains, N. Y., calved January 16, 1880, sire Baron of Brookdale, 28511, dam Constance 6th by 7th Duke of Airdrie (23718), gr. d. Constance 3rd by Clifton Duke (23580).

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SHORTHORN BULLS ONE YEAR OLD.

Daniel B. Haight, Dover Plains, N. Y., second prize, $15; Lord of Rowfant, red and white, bred by B. C. Rumsey, Buffalo, N. Y., calved May 16, 1881, sire 2nd Duke of Cornwall (43082), dam Rowfant Peach by 2d Duke of Underley (36551), gr. d Peach Blossom 12th by 8th Duke of York (28480).

SHORTHORN BULL CALVES OVER FIVE MONTHS OLD.

William S. Moore, Jr., Mount Upton, N. Y., second prize, $5; Waterloo of Upton, roan, bred by exhibitor, calved November 19, 1881, sire Waterloo, dam Countess of Lonsdale by Bancroft 5341, gr. d. Duchess of Lancaster by Grand Duke of Oxford (16184).

SHORTHORN COWS OVER THREE YEARS OLD.

Daniel B. Haight, Dover Plains, N. Y., first prize, $40; Constance of Lyndale 8th, roan, bred by W. S. King, Minneapolis, Minn., calved March 10, 1876, sire 7th Lord Oxford 17586, dam Constance of Lyndale 2nd by Scotsman (27435), gr. d. Constance 6th by 7th Duke of Airdrie (23718).

M. B. Ritter, Waterloo, N. Y., second prize, $20; Maud May 2nd, red with a little white, bred by exhibitor, calved May 14, 1877, sire Royal Duke of Waterloo 18252, dam Flora by Duke of Airdrie 2743, gr. d. Florida by Colin Campbell 3763.

SHORTHORN HEIFERS TWO YEARS OLD.

M. B. Ritter, Waterloo, N. Y., first prize, $30; Grace, red with a little white, bred by exhibitor, calved February 18, 1880, sire Prince of the River 12677, dam Flora by Duke of Airdrie 2743, gr. d. Florida by Colin Campbell 3763.

Daniel B. Haight, Dover Plains, N. Y., second prize, $15; Constance of Brookdale 7th, roan, bred by exhibitor, calved December 16, 1879, sire Baron of Brookdale 28 11, dam Constance 5th by Earl of Seaham 8077, gr. d. Constance 3rd by Clifton Duke 3760 (23580).

SHORTHORN HEIFERS ONE YEAR OLD.

M. B. Ritter, Waterloo, N. Y., first prize, $20; Princess 3rd, red with a little white, bred by exhibitor, calved February 24, 1881, sire Prince of the River 12677, dam Maud by Warwick 6283, gr. d. Flora by Duke of Airdrie 2743.

Daniel B. Haight, Dover Plains, N. Y., second prize, $10; Constance of Brookdale 9th, red with a little white, bred by exhibitor, calved May 8, 1881, sire Oneida Prince 27359, dam Constance 5th by Earl of Seaham 8077, gr. d. Constance 3rd by Clifton Duke 3760 (23580).

SHORTHORN HEIFER CALVES OVER FIVE MONTHS OLD.

M. B. Ritter, Waterloo, N. Y., first prize, $10; Lotty S., red, bred by exhibitor, calved March 10, 1882, sire 3rd Earl of Oxford 35423, dam Flora by Duke of Airdrie 2743, gr. d. Florida by Colin Campbell 3763.

Benjamin Fellows, Clifton, N. Y., second prize, $5; Jennie, red, bred by exhibitor, calved March 29, 1882, sire Earl of Oxford 35422, dam 6th Duchess of Woodhill by Grand Duke of Gordon (28757), gr. d. Young Duchess of Woodhill by Garibaldi 17136.

DEVONS — DEVON HERD PRIZE.

A. F. Bronson, Vernon, N. Y.; large gold medal.

Bull, Jeddo, bred by James Buckingham, Zanesville, Ohio, calved March 31, 1880, sire Hudson 699, dam Nemophila 3rd, by Jack 721, gr. d. Nemophila by Omer Pasha 127.

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Cow, Sunshine, bred by E. W. Davis, Oneida, N. Y., calved September 16, 1877, sire Litchfield 789, dam Cherry by Connewango 428, gr. d. Fruitful by Roscius 1072.

Cow, Victoria, bred by George Rudd, Guelph, Canada, calved October 10, 1878, sire Prince Albert Victor 227¼, dam Maid of Honor by Hartland 655, gr. d. Cherry Pie, by Young Curley Prince of Wales 440.

Heifer, Bride of Greenwood, bred by George Rudd, Guelph, Canada, calved May 15, 1880, sire Kempenfelt 759, dam Blue Bell by Samson 6th 1101, gr. d. Daisy by Prince Albert 973.

Heifer, Harlie, bred by exhibitor, calved April 1, 1881, sire Brant 1344, dam Verna by Litchfield 789, gr. d. Belle by Grant 638.

Heifer, Ella Rhea, bred by George Rudd, Guelph, Canada, calved April 10, 1881, sire The Marquis 705, dam Blossom by Dandy 447, gr. d. Miss Ann by Hartland 655.

DEVON BULLS OVER THREE YEARS OLD.

Joseph Hilton, New Scotland, N. Y., first prize, $50; Prince of Wales 20th, bred by exhibitor, calved December 12, 1878, sire Crown Prince 434, dam Edith 9th by Prince of Wales 151, gr. d. Fanny by Prince of Wales 151.

William H. Jones, South Montrose, Penn, second prize, $25; Mordecai, bred by E. E. Tiffany, Brooklyn, Penn., calved March 19, 1879, sire Prince of Orange 1761, dam Edith 7th by Prince of Wales 151, gr. d. Edith 2nd by Sachem 1089.

DEVON BULLS TWO YEARS OLD.

A. F. Bronson, Vernon, N. Y., first prize, $40; Jeddo, bred by James Buckingham, Zanesville, Ohio, calved March 31, 1880, sire Hudson 699, dam Nemophila 3rd by Jack 721, gr. d. Nemophila by Omer Pasha 127.

Ensign & Brown, Jeddo, N. Y., second prize, $20; Zib, bred by A. F. Bronson, Vernon, N. Y., calved April 1, 1880, sire Lord Nelson 2nd 801, dam Cherry 3rd by Mohawk 872, gr. d. Cherry by Young Baltimore 267.

DEVON BULLS ONE YEAR OLD.

A. F. Bronson, Vernon, N. Y., first prize, $30; Wonder, bred by exhibitor, calved May 10, 1881, sire Brant 1344, dam Flora by Grant 638, gr. d. Tilt by Dandy 445.

J. A. Pomeroy, Sidney Centre, N. Y., second prize, $15; Hiawatha, bred by Truman Baker, Earlville, N. Y., calved January 29, 1881, sire Litchfield 2nd 1766, dam Jenny Lind 7th by Mohawk 872, gr. d. Jenny Lind 4th by Frank Baker 572.

DEVON BULL CALVES OVER FIVE MONTHS OLD.

William M. White, Canaseraga, N. Y., first prize, $10; Hugo, bred by exhibitor, calved March 16, 1882, sire Independence 718, dam Lovely 24th by Red Jacket 1033, gr. d. Wanda 2nd, by Queen Anne's Huron 1014.

J. A. Pomeroy, Sidney Centre, N. Y., second prize, $5; Dandy Devon, bred by exhibitor, calved April 1, 1882, sire Uncas 1196, dam Silvy by Genesee 2nd 616, gr. d. Long Horn by Mohawk 872.

DEVON COWS OVER THREE YEARS OLD.

A. F. Bronson, Vernon, N. Y., first prize, $40; Victoria, bred by George Rudd, Guelph, Canada, calved October 10, 1878, sire Prince Albert Victor 227¼, dam Maid of Honor by Hartland 655, gr. d. Cherry Pie by Young Curley Prince of Wales 440.

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Joseph Hilton, New Scotland, N. Y., second prize, $20; Edith 12th, bred by exhibitor, calved December 12, 1875, sire Prince of Wales 151, dam Edith 4th by Prince of Wales 151, gr. d. Edith 2nd by Sachem 1089.

DEVON HEIFERS TWO YEARS OLD.

A. F. Bronson, Vernon, N. Y., first prize, $30; Bride of Greenwood, bred by George Rudd, Guelph, Canada, calved May 15, 1880, sire Kempenfelt 759, dam Blue Bell by Sampson 6th 1101, gr. d. Daisy by Prince Albert 978.

William H. Jones, South Montrose, Penn., second prize, $15; Audenreid, bred by exhibitor, calved June 1, 1880, sire Jones' Prince of Wales 751½, dam Rose of May by Prince of Wales 12th 1002, gr. d. Old Rose 3rd by Comet 420.

DEVON HEIFERS ONE YEAR OLD.

A. F. Bronson, Vernon, N. Y., first prize $20; Harlie, bred by exhibitor, calved April 1, 1881, sire Brant 1344, dam Verna by Litchfield 789, gr. d. Belle by Grant 638.

Joseph Hilton, New Scotland, N. Y., second prize, $10; Lucy, bred by exhibitor, calved March 3, 1881, sire Crown Prince 434, dam Edith 13th by Prince of Wales 151, gr. d. Edith 7th by Prince of Wales 151.

DEVON HEIFER CALVES OVER FIVE MONTHS OLD.

William M. White, Canaseraga, N. Y., first prize, $10; Lovely 36th, bred by exhibitor, calved March 20, 1882, sire Independence 718, dam Lovely 21st by Lovely's Huron 3rd 806, gr. d. Lovely 18th by Young Exeter 546.

Ensign & Brown, Jeddo, N. Y., second prize, $5; Mabel, bred by exhibitors, calved March 13, 1882, sire Zib, dam Hollyberry, by Doctor 462, gr. d. Verna by Litchfield 789.

HEREFORDS — HEREFORD HERD PRIZE.

Erastus Corning, Albany, N. Y., large gold medal.

Bull, Comus, red with white face, bred by P. Turner, Pembridge, Herefordshire, England, calved July 21, 1872, sire Provost (4067), dam Kathleen by Bolingbroke (1883), gr. d. Redwing by Felix (953).

Cow, Marchioness 2nd, red with white face, bred by exhibitor, calved April, 1869, sire Major, dam Marchioness by Washington (5134), gr. d. Lady, imported by exhibitor.

Cow, Victoria 6th, red with white face, bred by exhibitor, calved June 12, 1874, sire Taurus, dam Victoria 5th by S. Goddard, gr. d. Victoria 4th by Cardinal Wiseman.

Cow, Katy, red with white face, bred by exhibitor, calved April, 1875, sire Comus (4457), dam Princess 2nd by Washington (5134), gr. d. Princess, imported by exhibitor.

Cow, Topsy-Turvy, red with white face, bred by exhibitor, calved March 13, 1877, sire Comus (4457), dam Topsy by Taurus, gr. d. Marchioness 2nd, by Major.

Cow, Edna, red with white face, bred by exhibitor, calved February 9, 1879, sire Comus (4457), dam Victoria 6th by Taurus, gr. d. Victoria 5th by S. Goddard.

HEREFORD BULLS OVER THREE YEARS OLD.

Erastus Corning, Albany, N. Y., first prize, $50; Comus, red with white face, bred by P. Turner, Pembridge, Herefordshire, England, calved July 21, 1872, sire Provost (4067), dam Kathleen by Bolingbroke (1883), gr. d. Redwing by Felix (953).

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HEREFORD COWS OVER THREE YEARS OLD.

Erastus Corning, Albany, N. Y., first prize, $40; Marchioness 2nd, red with white face, bred by exhibitor, calved April, 1869, sire Major, dam Marchioness by Washington (5134), gr. d. Lady, imported by exhibitor.

HEREFORD HEIFER CALVES OVER FIVE MONTHS OLD.

Erastus Corning, Albany, N. Y., first prize, $10; Edna 2nd, red with white face, bred by exhibitor, calved December 31, 1881, sire Comus (4457), dam Edna by Comus (4457), gr. d. Victoria 6th by Taurus.

AYRSHIRES — AYRSHIRE HERD PRIZE.

Ambie S. Tubbs, Mexico, N. Y., large gold medal.

Bull, Shirley Douglas, red with a little white, bred by Joseph F. Brown, Providence, R. I., calved July 31, 1880, sire Enoch Douglas 2001, dam Floy Douglas by Lord Lyon 691, gr. d. Jessie Douglas by McIvor 46.

Cow, Dahlia 2nd, red and white, bred by J. F. Converse, Woodville, N. Y., calved May 6, 1872, sire Woodville Chief 1542, dam Dahlia (imported in 1871 by J. F. Converse) by Gilpin, gr. d. Flecky.

Cow, Dahlia 3rd, red and white, bred by J. F. Converse, Woodville, N. Y., calved April, 1874, sire Woodville Chief 1542, dam Dahlia (imported in 1871 by J. F. Converse) by Gilpin, gr. d. Flecky.

Cow, Dahlia 5th, red and white, bred by J. F. Converse, Woodville, N. Y., calved April 15, 1876, sire Woodville Chief 1542, dam Dahlia (imported in 1871 by J. F. Converse) by Gilpin, gr. d. by Flecky.

Heifer, Josie Douglas, red and white, bred J. F. Converse, Woodville, N. Y., calved April 4, 1881, sire Prince Charley 1689, dam Dahlia 3rd by Woodville Chief 1542, gr. d. Dahlia (imported in 1871 by J. F. Converse).

Heifer, Jane Douglas, red and brown with a little white, bred by Lewis Tubbs & Son, Mexico, N. Y., calved April 18, 1881, sire Prince Charley 1689, dam Jane Garfield by Kash 1237, gr. d. Helen Pender by Woodville Chief 1542.

AYRSHIRE BULLS OVER THREE YEARS OLD.

Warren Crissey, Great Barrington, Mass., first prize, $50; Clifford, red and white, bred by exhibitor, calved May 20, 1879, sire Laird of Avon 2061, dam Snowdrop by Mars 715, gr. d. Medora by Tarbolton 372.

Oneida Community Limited, Community, N. Y., second prize, $25; Kilmarnock, 25th, red and white, bred by exhibitor, calved December 26, 1877, sire Kilmarnock 1245, dam Mistress 3rd by Eglinton 21, gr. d. Mistress 2nd imported by H. H. Peters.

AYRSHIRE BULLS TWO YEARS OLD.

Ambie S. Tubbs, Mexico, N. Y., first prize, $40; Shirley Douglas, red with a little white, bred by Joseph F. Brown, Providence, R. I., calved July 31, 1880, sire Enoch Douglas 2001, dam Floy Douglas by Lord Lyon 691, gr. d. Jessie Douglas by McIvor 46.

H. R. C. Watson, West Farms, N. Y., second prize, $20; Gayarre, mostly red, bred by J. F. Converse, Woodville, N. Y., calved April 4, 1880, sire Woodville Chief 1542, dam Bessie Belle, imported by J. F. Converse.

AYRSHIRE BULLS ONE YEAR OLD.

H. R. C. Watson, West Farms, N. Y., first prize, $30; Sir Hugh, red and white, bred by William Watson, West Farms, N. Y., calved May 25, 1881, sire Robert

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Mars 2176, dam Lily by Sir Thomas Moore 1469, gr. d. Ayrshire Mary, imported by William Rodden, Montreal, Canada.

E. B. Hawks, Wells Bridge, N. Y., second prize, $15; Scotch Chief, red and white, bred by Thomas Miller, Brushland, N. Y., calved June 10, 1881, sire Sir Henry 2496, dam Rosy, imported by Thomas Miller.

AYRSHIRE BULL CALVES OVER FIVE MONTHS OLD.

Ambie S. Tubbs, Mexico, N. Y., first prize, $10; Vinewood Prince, red and white, bred by Lewis Tubbs & Son, Mexico, N. Y., calved October 13, 1881, sire Mexico Prince 2431, dam Dahlia 2nd by Woodville Chief 1542, gr. d. Dahlia, imported in 1871 by J. F. Converse, Woodville, N. Y.

G. H. Bell, Rome, N. Y., second prize, $5; Winfield Boy 3rd, red and white, bred by exhibitor, calved March 17, 1882, sire Winfield Boy 2610, dam Draxy Miller by 224 Treasurer, gr. d. Pet by 200 Rob Roy.

AYRSHIRE COWS OVER THREE YEARS OLD.

Ambie S. Tubbs, Mexico, N. Y., first prize, $40; Dahlia 5th, red and white, bred by J. F. Converse, Woodville, N. Y., calved April 15, 1876, sire Woodville Chief 1542, dam Dahlia, imported in 1871 by J. F. Converse, by Gilpin, gr. d. Flecky.

H. R. C. Watson, West Farms, N. Y., second prize, $20; Duchess of Smithfield, red and white, bred by H. E. Smith, Smithfield, R. I., calved December 20, 1876, sire Lion Douglas 1261, dam Hester 2nd by Prince Edward 787, gr. d. Hester by Lord Lion 691.

AYRSHIRE HEIFERS TWO YEARS OLD.

H. R. C. Watson, West Farms, N. Y., first prize, $30; Bonnie Annie, dark red and white, bred by estate of William Watson, West Farms, N. Y., calved February 15, 1880, sire General Montgomery 2170, dam Anna 2nd by Belcher 665, gr. d. Anna by Angus 1550.

G. H. Bell, Rome, N. Y., second prize, $15; Draxy's Daughter, white and red, bred by exhibitor, calved April 5, 1880, sire 813 Gansevoort, dam Draxy Miller by 224 Treasurer, gr. d. Pet by 200 Rob Roy.

AYRSHIRE HEIFERS ONE YEAR OLD.

H. R. C. Watson, West Farms, N. Y., first prize, $20; Roxana 6th, mostly red, bred by J. D. W. French, North Andover, Mass., calved June 23, 1881, sire Moncrieff 2516, dam Roxana by McDonald 3rd 263, gr. d. Rose by Sauter Johnnie 71.

Stryker & Jones, Rome, N. Y., second prize, $10; Princess Louise, dark red and white, bred by Jardine & Sons, Hamilton, Canada, calved September 27, 1880, sire Mars 1st 2177, dam Princess Louise, imported by Jardine & Sons.

AYRSHIRE HEIFER CALVES OVER FIVE MONTHS OLD.

G. H. Bell, Rome, N. Y., first prize, $10; Daisy Tresham 2nd, red and white, bred by exhibitor, calved February 21, 1882, sire Winfield Boy 2610, dam Daisy Tresham by 853 Kilmarnock 2nd, gr. d. Kate Tresham by Norval 763.

Stryker & Jones, Rome, N. Y., second prize, $5; Spotted Beauty 4th, white and red, bred by exhibitors, calved March 1, 1882, sire 935 Romulus, dam Spotted Beauty 2nd by 208 Rocket, gr. d. Spotted Beauty by 182 Ploughboy.

HOLSTEINS — HOLSTEIN HERD PRIZE.

Smiths & Powell, Syracuse, N. Y., large gold medal.

Bull, Prince of Edam, black and white, bred by M. Brommersma, Purmer, North Holland, calved March 15, 1878, sire District Bull, dam Grietji.

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Cow, Ægis, black and white, bred by Gerrit S. Miller, Peterboro, N. Y., calved October 2, 1873, sire Rip Van Winkle 35, dam Agoo, imported

Cow, Lady Netherland, black and white, bred by A. C. Koning, Beemster, North Holland, calved March 10, 1874.

Cow, Aaggie, black and white, bred by J. Wit Az, Midwoud, North Holland, calved April 1, 1874.

Cow, Netherland Queen, black and white, bred by A. C. Koning, Beemster, North Holland, calved March 26, 1877, dam Lady Netherland.

Cow, Carlotta, black and white, bred by C. Beets, Beemster, North Holland, calved March, 1879, sire District Bull.

HOLSTEIN BULLS OVER THREE YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $50; Prince of Edam, black and white, bred by M. Brommersma, Purmer, North Holland, calved March 15, 1878, sire District Bull, dam Grietji.

Stryker & Jones, Rome, N. Y., second prize, $25; Barneveld, white and black, bred by John Stryker, Rome, N. Y., calved March 1, 1879, sire Richelieu 333, dam Lea, imported by John H. Comer, Goshen, N. Y., in 1874.

HOLSTEIN BULLS TWO YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $40; Netherland Prince, black and white, bred by A. C. Koning, Beemster, North Holland, calved April 1, 1880, sire Schimmel, dam Lady Netherland.

F. T. Ferguson, Malone, N. Y., second prize, $20; Ginger, black and white, bred by H. C. Hoffman, Horseheads, N. Y., calved March 10, 1880, sire Dyken 233, dam Holland Princess by Holland Prince 113, gr. d. Holland Queen, imported by T. E. Whiting, Concord, Mass.

HOLSTEIN BULLS ONE YEAR OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $30; Benjamin, black and white, bred by William M. Singerly, Philadelphia, Penn., calved February 21, 1881, sire Iagoo 270, dam Agostina, imported from North Holland by W. R. Willetts, Skaneateles, N. Y., December, 1878.

Howard G. White, Syracuse, N. Y., second prize, $15; Prince Bismarck, black and white, bred by exhibitor, calved February 20, 1881, sire Corujum 424, dam Vlaaske, imported by exhibitor.

HOLSTEIN BULL CALVES OVER FIVE MONTHS OLD.

Smiths & Powell, Syracuse N. Y., first prize, $10; Prince Imperial, black and white, bred by exhibitors, calved April, 1882, sire Netherland Prince 716, dam Carlotta, imported.

Smiths & Powell, Syracuse, N. Y., second prize, $5; Kenmore, black and white, bred by D. Schoper, Westwond, North Holland, calved February 24, 1882, sire District Bull, dam Czarina.

HOLSTEIN COWS OVER THREE YEARS OLD.

Howard G. White, Syracuse, N. Y., first prize, $40; Princess Dagmar, black and white, bred by exhibitor, calved February 11, 1879, sired in Holland, dam Vlaaske, imported by exhibitor.

Smiths & Powell, Syracuse, N. Y., second prize, $20; Netherland Queen, black and white, bred by A. C. Koning, Beemster, North Holland, calved March 26, 1877, dam Lady Netherland.

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HOLSTEIN HEIFERS TWO YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $30; Ristori, black and white, bred by Jacob Hartog, Beemster, North Holland, calved March 13, 1880, sire District Bull, dam Tyme.

Smyths & Powell, Syracuse, N. Y., second prize, $15; Hazel Kirke, black and white, bred by C. Donker, Benningbrocht, North Holland, calved February 23, 1880, sire District Bull, dam Anna 2nd.

HOLSTEIN HEIFERS ONE YEAR OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $20; Netherland Queen 3rd, black and white, bred by exhibitors, calved May 16, 1881; sire Uncle Tom, 163, dam Netherland Queen, imported in dam Lady Netherland.

Smiths & Powell, Syracuse, N. Y., second prize, $10; Damsel 2nd, black and white, bred by Jan de Boer, Nijdrecht, North Holland, calved February 24, 1881, sire Sijmen (93), dam Grietji.

HOLSTEIN HEIFER CALVES OVER FIVE MONTHS OLD.

Stryker & Jones, Rome, N. Y., first prize, $10; Lady of Oneida 2nd, black and white, bred by exhibitors, calved February 10, 1882, sire Rubenstein 450, dam Lady of Oneida, by 4th Prince of Orange 246, gr. d. Lea, imported by John H. Comer, Goshen, N. Y., in 1874.

Smiths & Powell, Syracuse, N. Y., second prize, $5; Meadow Lily 3rd, black and white, bred by exhibitors, calved April, 1882, sire Uncle Tom 163, dam Meadow Lily, imported from North Holland in July, 1879, by exhibitors.

JERSEYS—JERSEY HERD PRIZE.

Theodore F. H. Meyer, Bolton, N. Y., large gold medal.

Bull, Polonius, dark fawn, bred by A. B. Darling, New York, N. Y., calved November 6, 1875, sire Sarpedon 930, dam Leda by Jupiter 93, gr. d. Europa by Jupiter 93.

Cow, Beauty, light brown, bred by Amice Alexander, Isle of Jersey, calved in 1873, imported by John D. Wing in 1880.

Cow, Fancy Fan, solid brown, bred on Isle of Jersey, calved April, 1875, imported by John D. Wing in 1880.

Cow, St. Mary's Lass, dark fawn, bred on Isle of Jersey, calved April, 1878, imported by John D. Wing in 1880.

Cow, Young Duchess, dark fawn, bred by Admiral Saumarez, Isle of Jersey, calved spring of 1876, imported by John D. Wing in 1880.

Cow, Belle of Suffield 3rd, brown with white spots, bred by Horatio J. Lothrop, Suffield, Conn., calved April 4, 1877, sire Bellini 2nd 1761, dam Belle of Suffield by Sam 980, gr. d. Nelly 4th by Don Pedro 836.

JERSEY BULLS OVER THREE YEARS OLD.

Theodore F. H. Meyer, Bolton, N. Y., first prize, $50; Polonius, dark fawn, bred by A. B. Darling, New York, calved November 6, 1875, sire Sarpedon 930, dam Leda by Jupiter 93, gr. d. Europa by Jupiter 93.

John D. Wing, Millbrook, N. Y., second prize, $20; John Rex, orange fawn, bred by W. S. & H. E. Savage, East Berlin, Conn., calved March 4, 1876, sire Rex 1330, dam Usilda, imported in dam Lady Messervy by H. M. Wellington in January, 1869.

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JERSEY BULLS TWO YEARS OLD.

John D. Wing, Millbrook, N. Y., first prize, $40; Tadcaster, dark fawn, bred by John Hudin, Isle of Jersey; calved July 28, 1880, sire Devil to Pay (F. S. 230, J. H. B.), dam Tidy 2nd by Vertumnus (P. S. 161, J. H. B.), gr. d. Tidy (P. S. 124, J. H. B.)

Edward L. Clarkson, Tivoli, N. Y., second prize, $20; Eric of Clermont, squirrel gray, bred by exhibitor, calved April 16, 1880, sire Index 1743, dam Eveline of Jersey, imported by exhibitor March 5, 1878.

JERSEY BULLS ONE YEAR OLD.

F. S. Peer, East Palmyra, N. Y., first prize, $30; Duke of Manchester, squirrel gray, bred by H. Schutt, Port Gibson, N. Y., calved March 13, 1881, sire Troy 5404, dam Mollie Garfield by Bel Caliph 1432, gr. d. Maple Dale by Victor 797.

H. B. Curran, Whitestown, N. Y., second prize, $15; Young Rajah, gray and white, bred by John S. Barstow, South Portsmouth, R. I., calved April 28, 1881, sire Rajah of Greenvale 2533, dam Miss Lee by Magnetic 1428, gr. d. Lady Lee by Rajah 340.

JERSEY BULL CALVES OVER FIVE MONTHS OLD.

John D. Wing, Millbrook, N. Y., first prize, $10; , dark fawn, bred by exhibitor, calved March 1, 1882, sire Tadcaster 5150, dam Mahala 2nd by Polonius 2513, gr. d. Mahala by Rex 1330.

Edward L. Clarkson, Tivoli, N. Y., second prize, $5; Young Duke of Darlington, squirrel gray, bred by W. A. Mullin, Mt Holly Springs, Penn., calved February 8, 1882, sire Duke of Darlington 2460, dam Lady Vermont, imported in dam Miss Vermont by W. R. McCready, Saugatuck, Conn., in September, 1878.

JERSEY COWS OVER THREE YEARS OLD.

Theodore F. H. Meyer, Bolton, N. Y., first prize, $40; Fancy Fan, solid brown, bred on Isle of Jersey, calved April, 1875, imported by John D. Wing in 1880.

Erastus Corning, Albany, N. Y., second prize, $20; Maida, deer color and black, bred by Thomas H. Faile, West Farms, N. Y., calved May 2, 1875, sire Bismarck 1423, dam Myrita by Mercury 432, gr. d. Myra by Dolphin 2nd 468.

JERSEY HEIFERS TWO YEARS OLD.

John D. Wing, Millbrook, N. Y., first prize, $30; Flower Girl, smoky fawn, bred on Isle of Jersey, calved April 10, 1880, sire Carlo (P. S. 180, J. H. B.).

H. W. Skerritt, Deansville, N. Y., second prize, $15; Eola, light fawn, bred by George Blanchard & Bro., Cumberland Centre, Me., calved May 12, 1880. sire Floto 7241, dam Olivia Bell by Duke of Cumberland 1847, gr. d. Obella by Nutshell 729.

JERSEY HEIFERS ONE YEAR OLD

Theodore F. H. Meyer, Bolton, N. Y., first prize, $20; Esmeraldina, fawn, bred by William S. Taylor, Burlington, N. J., calved June 16, 1881, sire Gilderoy 2nd 4037, dam Pattie Mc 6th by Jersey Dick 2936, gr. d. Pattie Mc by Roxbury 247.

H. R. C. Watson, West Farms, N. Y., second prize, $10; Young Lady, dark fawn, bred by Charles F. Dorey, Trinity, Jersey, calved June 4, 1881, sire Dido (251 P. S.). dam Lady Young.

JERSEY HEIFER CALVES OVER FIVE MONTHS OLD.

H. B. Curran, Whitestown, N. Y., first prize, $10; Valencia, fawn and white, bred by John S. Barstow, South Portsmouth, R. I., calved December 5, 1881, sire

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Newsboy 5689, dam Barine by Rajah of Greenvale 2533, gr. d. Unita by Nonquit 1391.

H. R. C. Watson, West Farms, N. Y., second prize, $5; Cherry Budd, pure fawn, bred by exhibitor, calved February 10, 1882, sire Budd 4469, dam Cherry Ripe by Westchester 1266, gr. d. Light Fawn, imported by Captain Pratt in 1870.

GUERNSEYS — GUERNSEY HERD PRIZE.

L. W. Ledyard, Cazenovia, N. Y., large gold medal.

Bull, Fernwood, orange fawn and white, calved April 2, 1878, imported in dam Fernwood Fancy by C. M. Beach, Hartford, Conn.

Cow, Elegante, orange fawn and white, bred by Stephen Le Pelley, in Guernsey, calved December, 1874, sire Excelsior 1st, dam Elegante.

Cow, Roselle, orange fawn and white, bred by Augustus Ward, Farmington, Conn., calved July 6, 1877, sire Prince 17, dam La Gelé, imported by M. C. Weld, New York, April, 1876.

Cow, Lastrea, orange fawn and white, bred by Jean Le Coquierre in Guernsey, calved January, 1879.

Heifer, Olivette, orange fawn and white, bred by Augustus Ward, Farmington, Conn., calved March 6, 1880, sire Dom Pedro 52, dam La Gelé, imported by M. C. Weld, New York, April, 1876.

Heifer, Fern Leaf, orange fawn and white, bred by exhibitor, calved February 13, 1881, sire Fernwood 190, dam Kathleen, imported by C. M. Beach, Hartford, Conn, October 27, 1877.

GUERNSEY BULLS OVER THREE YEARS OLD.

L. W. Ledyard, Cazenovia, N. Y., first prize, $50; Fernwood, orange fawn and white, calved April 2, 1878, imported in dam Fernwood Fancy, by C. M. Beach, Hartford, Conn.

GUERNSEY BULLS TWO YEARS OLD.

Henry A. Morgan, Aurora, N. Y., first prize, $40; Gold Fern, orange fawn and white, bred by William Burridge, St. Andrew's Parish, Guernsey, calved December, 1879, sire St. Andrew 2nd, dam Nellie.

GUERNSEY BULLS ONE YEAR OLD.

L. W. Ledyard, Cazenovia, N. Y., first prize, $30; Sunshine, light orange fawn, bred by Edward Norton, Farmington, Conn., calved March 16, 1881, sire Malbrook 23, dam Princess, imported by M. C. Weld in April, 1876.

Howard G. White, Syracuse, N. Y., second prize, $15; Duke of Fernwood, light orange fawn and white, bred by L. W. Ledyard, Cazenovia, N. Y., calved July 31, 1881, sire Fernwood 190, dam Fernwood Fancy, imported by C. M. Beach, Hartford, Conn.

GUERNSEY BULL CALVES OVER FIVE MONTHS OLD.

L. W. Ledyard, Cazenovia, N. Y., first prize, $10; Guernsey Boy, orange fawn and white, bred by exhibitor, calved December 4, 1881, sire Gold Fern 243, dam Onoclea, imported by exhibitor September 10, 1880.

GUERNSEY COWS OVER THREE YEARS OLD.

L. W. Ledyard, Cazenovia, N. Y., first prize, $40; Elegante, orange fawn and white, bred by Stephen Le Pelley in Guernsey, calved December, 1874, sire Excelsior 1st, dam Elegante.

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GUERNSEY HEIFERS TWO YEARS OLD.

L. W. Ledyard, Cazenovia, N. Y., first prize, $30; Ontiora, reddish fawn, bred by LeGrand B. Cannon, Burlington, Vt., calved May 6, 1880, sire Clover 101, dam Maggie, imported in dam Elsie by James Lawrence, Groton, Mass.

GUERNSEY HEIFERS ONE YEAR OLD.

Howard G. White, Syracuse, N. Y., first prize, $20; Bonita, light orange fawn and white, bred by L. W. Ledyard, Cazenovia, N. Y., calved July 30, 1881, sire Powhattan 144, dam Maggie, imported in dam Elsie by James Lawrence, Groton, Mass., in May, 1878.

L. W. Ledyard, Cazenovia, N. Y., second prize, $10; Serpolette, orange fawn and white, bred by Augustus Ward, Farmington, Conn., calved March 19, 1881, sire Dom Pedro 52, dam La Gelé, imported by M. C. Weld, New York, April, 1876.

GUERNSEY HEIFER CALVES OVER FIVE MONTHS OLD.

L. W. Ledyard, Cazenovia, N. Y., first prize, $10; Fillette, orange fawn and white, bred by E. W. and H. W. Tillotson, Farmington, Conn., calved October 16, 1881, sire Coronet 149, dam Mouchette, imported by M. C. Weld, New York, April 14, 1876.

MILCH COWS OF ANY BREED.

Smiths & Powell, Syracuse, N. Y., first prize, $30; Holstein cow, Aaggie, black and white, bred by J. Wit Az, Midwoud, North Holland, calved April 1, 1874.

Smiths & Powell, Syracuse, N. Y., second prize, $15; Holstein cow, Lady Netherland, black and white, bred by A. C. Koning, Beemster, North Holland, calved March 10, 1874.

OXEN, STEERS AND FAT CATTLE — FAT OXEN OVER FOUR YEARS OLD.

Erastus Corning, Albany, N. Y., first prize, $30; Pierre (Hereford), red with white face, bred by exhibitor, calved September, 1877, sire Comus (4457), dam Princess 3rd by Major, gr. d. Princess 2nd by Washington (5134).

Erastus Corning, Albany, N. Y., second prize, $15; George (Hereford), red with white face, bred by exhibitor, calved August, 1877, sire Comus (4457), dam Marchioness 2nd by Major, gr. d. Marchioness by Washington (5134).

FAT STEERS UNDER FOUR YEARS OLD.

George Ayrault, Poughkeepsie, N. Y., first prize, $30; grade shorthorn, red and white.

M. B. Ritter, Waterloo, N. Y., second prize, $15; grade shorthorn, red and white, bred by exhibitor, calved March 20, 1879, sire Prince of the River 12677, dam three-quarters shorthorn by Royal Duke of Waterloo 18252.

FAT COWS OVER FOUR YEARS OLD.

George Ayrault, Poughkeepsie, N. Y., first prize, $30; grade shorthorn, roan.

George Ayrault, Jr., Poughkeepsie, N. Y., second prize, $15; grade shorthorn, white.

FAT HEIFERS UNDER FOUR YEARS OLD.

George Ayrault, Jr., Poughkeepsie, N. Y., first prize, $30; grade shorthorn, red and white.

George Ayrault, Poughkeepsie, N. Y., second prize, $15; grade shorthorn, red and white.

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EXTRA AWARDS.

Frank B. Redfield, Batavia, N. Y., $100 for exhibition of Polled Angus, or Aberdeen cattle.

Zerah Rider, Cambridge, N. Y., $50 for exhibition of Swiss cattle.

HORSES.

BREEDING AND GROWING STOCK.

Special prize for the best draught or agricultural stallion, of any age or breed.

Smiths & Powell, Syracuse, N. Y., special prize, $100; Standard Bearer, brown, foaled June 7, 1880, imported by exhibitors, sire Lord Nelson, dam Jean by Clydesdale Jock (1415), gr. d. Nancy by Prince of Wales (676).

CLYDESDALES AND THEIR CROSSES — STALLIONS OVER FOUR YEARS OLD.

Christian Sitterly, Palatine, N. Y., first prize, $50; MacHenry, dark bay, 16.2, six years, bred by exhibitor, sire Clyde, dam Dolly by George, gr. d. by Rysdyk's Hambletonian.

Smiths & Powell, Syracuse, N. Y., second prize, $25; Climax, chestnut, foaled April 14, 1878, sire King of the East, dam by Henderson's Gray Clydesdale.

STALLIONS THREE YEARS OLD.

A. S. Cook, Binghamton, N. Y., first prize, $40; British Champion, Jr., black, 16 2, foaled July 20, 1879, sire British Champion, dam by imported Cumberland, gr d. by imported Marquis of Clydesdale.

Stephen Carpenter, Higginsville, N. Y., second prize, $20; Snowflake, iron gray, 15.1, bred by exhibitor, foaled May 26, 1879, sire Sir Franklin, imported by E. W. Sheppard, Meadville, Penn.

STALLIONS TWO YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $30; Standard Bearer, brown, foaled June 7, 1880, imported by exhibitors, sire Lord Nelson, dam Jean by Clydesdale Jock (1415), gr. d. Nancy by Prince of Wales (676).

MARES OVER FOUR YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $50; Queen of Scots, bay, foaled in 1872, sire Cannobie, imported, dam by imported Netherby.

FILLIES THREE YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $40; Jess, bay, foaled in 1879, sire King of the East, dam Young Giantess by Campsie Jock, gr. d. by Young Robin Hood.

FILLIES TWO YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $30; Highland Belle bay, foaled in 1880, sire Ontario Chief, imported, dam Queen of Scots by Cannobie imported, gr. d. by Old Netherby.

FILLIES ONE YEAR OLD.

Smiths & Powell, Syracuse. N. Y., first prize, $20; Princess, black, foaled July 11, 1881, sire Prince of Blacklaw, dam Lady of the Manor by Lord of the Manor, gr. d. Lady Wellington by Duke of Wellington.

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PERCHERONS AND THEIR CROSSES — STALLIONS OVER FOUR YEARS OLD.

Howard G. White, Syracuse, N. Y., first prize, $50; Raspail, gray, 17, seven years, bred by P. Sagoy, Nogent-le-Rotrou, France, imported by exhibitor, sire Pierrot, dam Couronne.

Wheeler & Mathews, Cedarville, N. Y., second prize, $25; Belleview, dapple gray, 16.2, five years, imported in 1877 bv M. W. Dunham, Wayne, Illinois.

STALLIONS TWO YEARS OLD.

John W. Akin, Scipio, N. Y., first prize, $30; De-ce-de, dark gray, sire Success, dam by French Emperor.

STALLIONS ONE YEAR OLD.

Wheeler & Matthews, Cedarville, N. Y., first prize, $20; Commodore, brown, foaled May 7, 1881.

John W. Akin, Scipio, N. Y., second prize, $10; Commodore, dark brown, sire Akin's Duke de Chartres, dam by English Yeoman.

MARES OVER FOUR YEARS OLD.

Howard G. White, Syracuse, N. Y., first prize $50; Chatton, gray, 16, six years, bred by Goupil Edree, Nogent-le-Rotrou, France, imported by exhibitor, sire Le Cœur Joly, dam Pauline.

Howard G. White Syracuse, N. Y., second prize, $25; Rustique, gray, 16.2, five years, bred by H. Guibert, Nogent-le-Rotrou, France, imported by exhibitor, sire Margot, dam Rustique.

FILLIES TWO YEARS OLD.

John W. Akin, Scipio, N. Y., first prize, $30; Minnie B., black, sire Pride, imported.

FILLIES ONE YEAR OLD.

Wheeler & Matthews, Cedarville, N. Y., first prize, $20; Florence, gray, foaled April 28, 1881.

John W. Akin, Scipio, N. Y., second prize, $10; Betsy, gray, sire Akin's Duke of Homer, dam by Norman Leslie, gr. d. by imported Louis Phillippe.

THOROUGHBREDS AND THEIR CROSSES, INCLUDING MESSENGERS OF ALL BRANCHES, CLAYS, MORGANS, COACHERS AND ALL FAMILIES FOUNDED UPON, OR MORE OR LESS IMPROVED BY, ENGLISH OR EASTERN BLOOD.

Special prize for the best stallion of any age.

Walcott Van de Bogart, Batavia, N. Y., special prize, $150; Blue Danube, bay, 16, five years, bred at Woodburn Farm, Ky., sire Woodford Mambrino, dam Cracovienne, by Alexander's Abdallah, gr. d. by Cracker, son of Boston.

STALLIONS OVER FIVE YEARS OLD.

Wolcott Van de Bogart, Batavia, N. Y., first prize, $70; blue Danube, bay, 16, five years, bred at Woodburn Farm, Ky., sire Woodford Mambrino, dam Cracovienne, by Alexander's Abdallah, gr. d. by Cracker, son of Boston.

Charles O. Shepard, Mount Morris, N. Y., second prize, $35; Zetland, dark bay, 16, nine years, sire Fireaway, dam by Ward's Venture.

STALLIONS FOUR YEARS OLD.

D. Gardner, Utica, N. Y., first prize, $60; Nisi Prius, bay, 15.3, bred by E. W. Kittridge, foaled April 8, 1878, sire Solicitor, dam Glencoria by Rysdyk's Hambletonian, gr. d. by Glencoe, imported.

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Edward Caney, Richfield Springs, N. Y., second prize, $30; Idlewild, rosewood bay, 16, bred by George F. Stevens, Illion, N. Y., sire Administrator, by Rysdyk's Hambletonian, dam by Iron Duke, gr. d. by Edwin Forrest.

STALLIONS THREE YEARS OLD.

N. P. Pond, Rochester, N. Y., first prize, $50; Thornwood, bay, 15.2¼, bred by H. M. Bugher, Woodland Farm, Glendale, Ohio, sire Woodlawn, by Hero of Thorndale, dam Mag Strader by Mambrino Clay, son of Kentucky Clay, gr. d. Susan Loder by Daniel Boone, son of Tom Crowder.

W. H. Powell, Hopewell Centre, N. Y., second prize, $25; bay, bred by exhibitor, sire Mambrino Hambletonian, dam Kitty Clay, by Potter's Clay.

STALLIONS TWO YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $40: Chancellor, bay, foaled March 24, 1880, sire Reveler, dam Ambra, by Rysdyk's Bellfounder, gr. d. Clip by Latourette's Bellfounder.

James K. P. Pine, Troy, N. Y., second prize, $20; Warwick, black, 15, foaled April 25, 1880, sire American Ethan, dam by Stewart's Hambletonian, gr. d. by Lone Star, son of Hill's Black Hawk.

STALLIONS ONE YEAR OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $30; James, bay, foaled April 16, 1881, sire Challenger, dam Lady Bonner by Robert Bonner.

A. F. Barnes, Farmington, N. Y., second prize, $15; Delmont, light chestnut, bred by exhibitor, foaled September 2, 1880, sire Tremont, dam Flora by Long Island, gr. d. by Nimrod (son of American Eclipse).

MARES OVER FIVE YEARS OLD.

N. B. Mann, Mannsville, N. Y., first prize, $60; Golden Slipper, chestnut, 15.3, six years, sire Ira Allen, dam by Andrew Jackson.

L'Vander C. Hess, Fenner, N. Y., second prize, $30; the Robinson Mare, golden chestnut, bred by James Robinson, Fenner, N. Y., foaled 1868, sire Major Anderson, dam by Warren's Messenger.

FILLIES THREE YEARS OLD.

Smiths & Powell, Syracuse, N. Y., first prize, $40; Gazelle, black, foaled April 25, 1879, sire Reveler, dam Eva by Satellite, gr. d. by a son of imported Consternation.

John S. Kent, Alder Creek, N. Y., second prize, $20; Maria, bay, 15.2.

FILLIES ONE YEAR OLD.

Wm. H. Pearce, New Hartford, N. Y., first prize, $20; bay, bred by exhibitor.

SHETLAND PONIES — STALLIONS OVER TWO YEARS OLD.

H. R. C. Watson, West Farms, N. Y., first prize, $20; Jim, black, 11, nine years, bred by William Watson, West Farms, N. Y.

STALLIONS UNDER TWO YEARS OLD.

H. R. C. Watson, West Farms, N. Y., first prize, $20; Chester, brown and white, 9.3, one year, bred by exhibitor, sire Montreal, dam Daisy.

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MARES OVER TWO YEARS OLD.

H. R. C. Watson, West Farms, N. Y., first prize, $20; Madge, black and white, 12, seven years, bred by James Richardson, Lachine, Canada.

FILLIES UNDER TWO YEARS OLD.

H. R. C. Watson, West Farms, N. Y., first prize, $20; Patience, bay, 9.3, one year, bred by exhibitor, sire Montreal, dam Jeannie.

HARNESS AND SADDLE HORSES — DRAUGHT PAIRS.

George Young, Utica, N. Y., first prize, $50; Peter and Jim, black geldings, 16, six and seven years.

D. M. Osborne & Co., Auburn, N. Y., second prize, $25; gray and bay.

COACH PAIRS.

H. B. Coon, Bridgewater, N. Y., first prize, $50; dark bay geldings, 16, five years.

J. D. Remington, Auburn, N. Y., second prize, $25; blacks, 16.2, five and six years.

PHAETON PAIRS.

George Young, Utica, N. Y., first prize, $50; Jim and Ned, black geldings, 15.2, eight years.

N. B. Mann, Mannsville, N. Y., second prize, $25; Charley J. and Rarus, chestnut, 15.2, foaled June, 1879.

COUPE HORSES.

Smith & Powell, Syracuse, N. Y., first prize, $30; Frank, bay gelding, six years.

George I. Wheeler, Rome, N. Y., second prize, $15; chestnut, 16.2, five years.

ROADSTERS.

A. M. Parker, Trenton, N. Y., first prize, $30; Harry, black, 16, six years, sire Signal, dam by Blucher.

William H. Schuyler, Utica, N. Y., second prize, $15; gray, 15.3, six years.

SADDLE HORSES.

H. Bowen, Medina, N. Y., first prize, $30; brown gelding, 15.2, six years.

H. R. C. Watson, West Farms, N. Y., second prize, $15; Olivette, brown, 15, six years, sire Jupiter Star.

PONIES (UNDER 13 HANDS) BROKEN TO HARNESS OR SADDLE.

H. R. C. Watson, West Farms, N. Y., first prize, $20; Montreal, piebald, 11, four years, bred by James Richardson, Lachine, Canada.

SHEEP, SWINE AND POULTRY

LONG-WOOLED SHEEP — LEICESTERS — RAMS OVER TWO YEARS OLD.

William S. Moore, Jr., Mount Upton, N. Y., first prize, $20; bred by John Clark.

RAMS ONE YEAR OLD.

W. L. & W. Rutherford, Waddington, N. Y., first prize, $20; bred by exhibitors.

RAM LAMBS.

William S. Moore, Jr., Mount Upton, N. Y., first prize, $10; bred by exhibitor.

W. L. & W. Rutherford, Waddington, N. Y., second prize, $5; bred by exhibitors.

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PENS OF EWES OVER TWO YEARS OLD,

W. L. & W. Rutherford, Waddington, N. Y., first prize, $20; bred by exhibitors.
William S. Moore, Jr., Mount Upton, N. Y., second prize, $10; bred by John Clark.

PENS OF YEARLING EWES.

W. L. & W. Rutherford, Waddington, N. Y., first prize, $20; bred by exhibitors.

PENS OF EWE LAMBS.

W. L. & W. Rutherford, Waddington, N. Y., first prize, $10; bred by exhibitors.

COTSWOLDS — RAMS OVER TWO YEARS OLD.

George Ingersoll, Charleston, N. Y., first prize, $20.
F. S. Peer, East Palmyra, N. Y., second prize, $10; bred by Robert Jacobs, Bedford, England.

RAMS ONE YEAR OLD.

George Ingersoll, Charleston, N. Y., first prize, $20.
George Ingersoll, Charleston, N. Y., second prize, $10.

RAM LAMBS.

George Ingersoll, Charleston, N. Y., first prize, $10.
F. S. Peer, East Palmyra, N. Y., second prize, $5; bred by exhibitor.

PENS OF EWES OVER TWO YEARS OLD.

George Ingersoll, Charleston, N. Y., first prize, $20.
F. S. Peer, East Palmyra, N. Y., second prize, $10; bred by Robert Jacobs, Bedford, England.

PENS OF YEARLING EWES.

George Ingersoll, Charleston, N. Y., first prize, $20.
F. S. Peer, East Palmyra, N. Y., second prize, $10; bred by Charles Barton, Fifield, England.

PENS OF EWE LAMBS.

F. S. Peer, East Palmyra, N. Y., first prize, $10; bred by Charles Barton.
George Ingersoll, Charleston, N. Y., second prize, $5.

MIDDLE-WOOLED SHEEP — SOUTHDOWNS — RAMS OVER TWO YEARS OLD

John Hobart Warren, Hoosick Falls, N. Y., first prize, $20; bred by John D. Wing.

RAMS ONE YEAR OLD.

John Hobart Warren, Hoosick Falls, N. Y., first prize, $20; bred by Lord Walsingham.
Daniel B. Haight, Dover Plains, N. Y., second prize, $10; bred by Robert Marsh.

RAM LAMBS.

Daniel B. Haight, Dover Plains, N. Y., first prize, $10; bred by exhibitor.
John Hobart Warren, Hoosick Falls, N. Y., second prize, $5; bred by exhibitor.

PENS OF EWES OVER TWO YEARS OLD.

Daniel B. Haight, Dover Plains, N. Y., first prize, $20; bred by exhibitor.
Daniel B. Haight, Dover Plains, N. Y., second prize, $10; bred by exhibitor.

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PENS OF YEARLING EWES.

Daniel B. Haight, Dover Plains, N. Y., first prize, $20; bred by exhibitor.
John Hobart Warren, Hoosick Falls, N. Y., second prize, $10; bred by exhibitor.

PENS OF EWE LAMBS.

John Hobart Warren, Hoosick Falls, N. Y., first prize, $10; bred by exhibitor.
Daniel B. Haight, Dover Plains, N. Y., second prize, $5; bred by exhibitor.

SHROPSHIRES — RAMS OVER TWO YEARS OLD.

Charles D. Sickler, Malta, N. Y., first prize, $20; Earl of Strathmore, bred by M H. Cochrane, Canada.
E. B. Hawks, Wells Bridge, N. Y., second prize, $10.

RAMS ONE YEAR OLD.

George Ingersoll, Charleston, N. Y., first prize, $20.

RAM LAMBS.

Charles D. Sickler, Malta, N. Y., first prize, $10; True Type, bred by exhibitor, sire and dam imported.
George Ingersoll, Charleston, N. Y., second prize, $5.

PENS OF EWES OVER TWO YEARS OLD.

Charles D. Sickler, Malta, N. Y., first prize, $20; bred by B. Harlescolt, England.
Charles D. Sickler, Malta, N. Y., second prize, $10; bred by B. Harlescolt, England.

PENS OF YEARLING EWES.

Charles D. Sickler, Malta, N. Y., first prize, $20; bred by exhibitor.
Charles D. Sickler, Malta, N. Y., second prize, $10; bred by exhibitor

PENS OF EWE LAMBS.

Charles D. Sickler, Malta, N. Y., first prize, $10; bred by exhibitor.
George Ingersoll, Charleston, N. Y., second prize, $5.

HAMPSHIRES — RAMS OVER TWO YEARS OLD.

Henry Metcalf, Canandaigua, N. Y., first prize, $20; bred by exhibitor.
W. C. & L. P. Smith, Penn Yan, N. Y., second prize, $10; bred by Henry Metcalf.

RAMS ONE YEAR OLD.

W. C. & L. P. Smith, Penn Yan, N. Y., first prize, $20; bred by exhibitors.
Henry Metcalf, Canandaigua, N. Y., second prize, $10; bred by exhibitor.

RAM LAMBS.

Henry Metcalf, Canandaigua, N. Y., first prize, $10; bred by exhibitor.
W. C. & L. P. Smith, Penn Yan, N. Y., second prize, $5; bred by exhibitors.

PENS OF EWES OVER TWO YEARS OLD.

Henry Metcalf, Canandaigua, N. Y., first prize, $20; bred by exhibitor.
W. C. & L. P. Smith, Penn Yan, N. Y., second prize, $10; bred by Henry Metcalf.

PENS OF YEARLING EWES.

Henry Metcalf, Canandaigua, N. Y., first prize, $20; bred by exhibitor.
W. C. & L. P. Smith, Penn Yan, N. Y., second prize. $10; bred by exhibitor.

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PENS OF EWE LAMBS

Henry Metcalf, Canandaigua, N. Y., first prize, $10; bred by exhibitor.
W. C. & L. P. Smith, Penn Yan, N. Y., second prize, $5; bred by exhibitors.

FINE-WOOLED SHEEP — MERINOS BRED FOR FINENESS OF WOOL — RAMS OVER THREE YEARS OLD.

Warren J. Tyler & Son, South Byron N. Y., first prize, $20; bred by C. R. Jones, Hubbardton, Vt.

RAM LAMBS.

Warren J. Tyler & Son, South Byron, N. Y., first prize, $10; bred by exhibitors.
R. M. Remington, Auburn, N. Y., second prize, $5.

PENS OF YEARLING EWES.

R. M. Remington, Auburn, N. Y., second prize, $10.

PENS OF EWE LAMBS.

R. M. Remington, Auburn, N. Y., second prize, $5.

BRED FOR WEIGHT OF FLEECE — RAMS OVER THREE YEARS OLD.

Warren J. Tyler & Son, South Byron, N. Y., first prize, $20; bred by S. B. Lusk, Batavia, N. Y.

RAMS TWO YEARS OLD.

Davis Cossitt, Onondaga, N. Y., first prize, $20.

RAMS ONE YEAR OLD.

Davis Cossitt, Onondaga, N. Y., first prize, $20.
C. D. & C. Kenyon, Centre White Creek, N. Y., second prize, $10; bred by D. W. Percy.

RAM LAMBS.

C. D. & C. Kenyon, Centre White Creek, N. Y., first prize, $10; bred by exhibitors.
Warren J. Tyler & Son, South Byron, N. Y., second prize, $5.

PENS OF EWES OVER THREE YEARS OLD.

Warren J. Tyler & Son, South Byron, N. Y., first prize, $20; bred by exhibitors.

PENS OF EWES TWO YEARS OLD.

Davis Cossitt, Onondaga, N. Y., first prize, $20.
Warren J. Tyler & Son, South Byron, N. Y., second prize, $10; bred by exhibitors.

PENS OF YEARLING EWES.

Davis Cossitt, Onondaga, N. Y., first prize, $20.
J. & R. C. James, Eagle Bridge, N. Y., second prize, $10.

PENS OF EWE LAMBS.

Davis Cossitt, Onondaga, N. Y., first prize, $10.
Warren J. Tyler & Son, South Byron, N. Y., second prize, $5; bred by exhibitors.

BRED FOR LENGTH OF STAPLE — RAMS OVER THREE YEARS OLD.

Warren J. Tyler & Son, South Byron, N. Y., first prize, $20; bred by C. R. Jones, Hubbardton, Vt.
C. D. & C. Kenyon, Centre White Creek, N. Y., second prize, $10; bred by exhibitors.

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RAMS TWO YEARS OLD.

William S. Moore, Jr., Mount Upton, N. Y., second prize, $10; bred by H. O. Moore.

RAMS ONE YEAR OLD.

Davis Cossitt, Onondaga, N. Y., first prize, $20.

C. D. & C. Kenyon, Centre White Creek, N Y., second prize, $10; bred by Charles E. Smith.

RAM LAMBS.

Warren J. Tyler & Son, South Byron, N. Y., first prize, $10; bred by exhibitors.

William S. Moore, Jr., Mount Upton, N. Y., second prize, $5; bred by exhibitor.

PENS OF EWES OVER THREE YEARS OLD.

Warren J. Tyler & Son, South Byron, N. Y., first prize, $20; bred by exhibitors.

C. D. & C. Kenyon, Centre White Creek, N. Y., second prize, $10; bred by exhibitors.

PENS OF EWES TWO YEARS OLD.

Davis Cossitt, Onondaga, N. Y., first prize, $20.

Warren J. Tyler & Son, South Byron, N. Y., second prize, $10; bred by exhibitors.

PENS OF YEARLING EWES.

Davis Cossitt, Onondaga, N. Y., first prize, $20.

Warren J. Tyler & Son, South Byron, N. Y., second prize, $10; bred by exhibitors.

PENS OF EWE LAMBS.

Warren J. Tyler & Son, South Byron, N. Y., first prize, $10; bred by exhibitors.

C. D. & C. Kenyon, Centre White Creek, N. Y., second prize, $5; bred by exhibitors.

SWINE — LARGE WHITE BREED — HERD PRIZE.

Charles Spice, Utica, N. Y., small gold medal.

BOARS OVER ONE YEAR OLD.

Charles Spice, Utica, N. Y., first prize, $20.

E. W. Davis, Oneida, N. Y., second prize, $10; Mars, bred by exhibitor.

BOARS UNDER ONE YEAR OLD.

E. W. Davis, Oneida, N. Y., first prize, $20; Vulcan, bred by exhibitor.

T. R. Proctor, Utica, N. Y., second prize, $10; bred by exhibitor.

SOWS OVER ONE YEAR OLD.

Charles Spice, Utica, N. Y., first prize, $20.

E. W. Davis, Oneida, N. Y., second prize, $10; Maid of Athens, bred by exhibitor.

SOWS UNDER ONE YEAR OLD.

Charles Spice, Utica, N. Y., first prize, $20.

POLAND CHINA — HERD PRIZE.

G. H. Bell, Rome, N. Y., small gold medal.

BOARS OVER ONE YEAR OLD.

G. H. Bell, Rome, N. Y., first prize, $20; Roman Chief; bred by exhibitor.

David Smith, Rome, N. Y., second prize, $10; Royal George, bred by G. H. Bell, Rome, N. Y., sire Marshland Boy, dam Spotted Beauty.

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BOARS UNDER ONE YEAR OLD.

G. H. Bell, Rome, N. Y., first prize $20; Oxford Lad, bred by James Greenwood, Jr.

SOWS OVER ONE YEAR OLD.

G. H. Bell, Rome, N. Y., first prize, $20; Bell's Favorite, bred by exhibitor.
John Bell, Rome, N. Y., second prize, $10; Maid of Lowell, bred by exhibitor.

SOWS UNDER ONE YEAR OLD.

G. H. Bell, Rome, N. Y., first prize, $20; Bell's Favorite 3rd, bred by exhibitor.
John Bell, Rome, N. Y., second prize, $10; Maid 2nd, bred by exhibitor.

SMALL WHITE BREED — HERD PRIZE.

T. R. Proctor, Utica, N. Y., small gold medal.

BOARS OVER ONE YEAR OLD.

T. R. Proctor, Utica, N. Y., first prize, $20; Lord John, bred by H. H. Ingersoll, Owego, N. Y., sire Crown Prince, dam Princess 4th by Duke of Yorkshire, imported.
T. R. Proctor, Utica, N. Y., second prize, $10; Diomede, bred by exhibitor, sire Rinaldo, dam Queen 3rd by King John 3rd.

BOARS UNDER ONE YEAR OLD.

T. R. Proctor, Utica, N. Y., first prize, $20; Proctor's John, bred by exhibitor, sire King John 16th, dam Queen 3rd by King John 3rd.
Ensign & Brown, Jeddo, N. Y., second prize, $10; bred by exhibitors.

SOWS OVER ONE YEAR OLD.

Ensign & Brown, Jeddo, N. Y., first prize, $20; Queen Bess 4th.
T. R. Proctor, Utica, N. Y., second prize, $10; Queen 4th, bred by H. H. Ingersoll, Owego, N. Y., sire King John 3rd, dam Queen by imported Duke of Yorkshire,

SOWS UNDER ONE YEAR OLD.

T. R. Proctor, Utica, N. Y., first prize, $20; Proctor's Duchess, bred by exhibitor, sire King John 16th, dam Marchioness B. by King George.
Ensign & Brown, Jeddo, N. Y., second prize, $10; Eugenia.

BERKSHIRES — HERD PRIZE.

T. R. Proctor, Utica, N. Y., small gold medal.

BOARS OVER ONE YEAR OLD.

T. R. Proctor, Utica, N. Y., first prize, $20; Emperor 3rd, bred by A. A. McArthur, Lobo, Ontario, sire Norton's Smithereen, dam Ridge Sallie 12th.
T. R. Proctor, Utica, N. Y., second prize, $10; Oxford Reserve, bred by John Snell's Sons, Edmonton, Ontario, sire Royal Maybreeze, dam Sally Oxford by Oxford.

BOARS UNDER ONE YEAR OLD.

T. R. Proctor, Utica, N. Y., first prize, $20; Proctor's Castor, bred by Arthur Stewart, England, sire King Birt, dam Lady Derby by Prodigal.
Oneida Community Limited, Community, N. Y., second prize, $10; Count of Oneida, bred by T. R. Proctor, sire Oxford Reserve, dam Night Flower.

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SOWS OVER ONE YEAR OLD.

T. R. Proctor, Utica, N. Y., first prize, $20; Queen of Utica, bred by John Snell's Sons, Edmonton, Ontario, sire Royal Hope, dam Cantata by Robin Hood.

T. R. Proctor, Utica, N. Y., second prize, $10; Clarice Clermont, bred by John Snell's Sons, Edmonton, Ontario, sire Royal Hope, dam Constance Clermont by Windermere.

SOWS UNDER ONE YEAR OLD.

T. R. Proctor, Utica, N. Y., first prize, $20; Proctor's Lady Oxford, bred by exhibitor, sire Oxford Reserve, dam Night Flower by Linden Cardinal.

T. R. Proctor, Utica, N. Y., second prize, $10; Proctor's Oxford Girl, bred by exhibitor, sire Oxford Reserve, dam Night Flower by Linden Cardinal.

ESSEX — BOARS OVER ONE YEAR OLD.

J. S. Woodward, Lockport, N. Y., first prize, $20.

SOWS OVER ONE YEAR OLD.

J. S. Woodward, Lockport, N. Y., first prize, $20.

SOWS UNDER ONE YEAR OLD.

J. S. Woodward, Lockport, N. Y., first prize, $20.

POULTRY.

ASIATICS — LIGHT BRAHMAS.

J. R. Draper, Troy, N. Y., first prize, $5.
Newton Adams, Utica, N. Y., second prize, $3.

DARK BRAHMAS.

Newton Adams, Utica, N. Y., first prize, $5.
Newton Adams, Utica, N. Y., second prize, $3.

BUFF, LEMON OR CINNAMON COCHINS.

D. A. Carter, Utica, N. Y., first prize, $5.
D. G. Ross, Ilion, N. Y., second prize, $3.

PARTRIDGE OR GROUSE COCHINS.

B. D. Sarr, Marcellus Falls, N. Y., first prize, $5.
B. D. Sarr, Marcellus Falls, N. Y., second prize, $3.

WHITE COCHINS.

C. L. G. Blessing, Slingerlands, N. Y., first prize, $5.
William H. Seeger, Colliers, N. Y., second prize, $3.

BLACK COCHINS.

William H. Underwood, East Scott, N. Y., second prize, $3.

DORKINGS — COLORED DORKINGS.

R. P. Wolcott, Holland Patent, N. Y., first prize, $5.
R. P. Wolcott, Holland Patent, N. Y., second prize, $3.

SILVER GRAY DORKINGS.

N. Barns & Son, New Hartford, N. Y., first prize, $5.
J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

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WHITE DORKINGS.

William H. Underwood, East Scott, N. Y., first prize, $5.
William H. Underwood, East Scott, N. Y., second prize, $3.

AMERICAN — DOMINIQUES.

Jones Wilcox, East Chatham, N. Y., first prize, $5.
Jones Wilcox, East Chatham, N. Y., second prize, $3.

PLYMOUTH ROCKS.

Newton Adams, Utica, N. Y., first prize, $5.
Stephen Treen, Utica, N. Y., second prize, $3.

HAMBURGHS — GOLDEN SPANGLED.

Newton Adams, Utica, N. Y., first prize, $5.
O. Howland & Son, Auburn, N. Y., second prize, $3.

SILVER SPANGLED.

Jones Wilcox, East Chatham, N. Y., first prize, $5.
Jones Wilcox, East Chatham, N. Y., second prize, $3.

GOLD PENCILED.

O. Howland & Son Auburn, N. Y., first prize, $5.
William H. Underwood, East Scott. N. Y., second prize, $3.

SILVER PENCILED.

William H. Underwood, East Scott, N. Y., first prize, $5.
William H. Underwood, East Scott, N. Y., second prize, $3.

BLACK.

Jones Wilcox, East Chatham, N. Y., first prize, $5.
Jones Wilcox, East Chatham, N. Y., second prize, $3.

SPANISH — BLACK SPANISH.

D. A. Carter, Utica, N. Y., second prize, $3.

WHITE LEGHORNS.

Newton Adams, Utica, N. Y., first prize, $5.
Newton Adams, Utica, N. Y., second prize, $3.

BROWN LEGHORNS.

Jones Wilcox, East Chatham, N. Y., first prize, $5.
Jones Wilcox, East Chatham, N. Y., second prize, $3.

BLACK LEGHORNS.

Worley C. Moat, Amsterdam, N. Y., second prize, $3.

DOMINIQUE LEGHORNS.

Jones Wilcox, East Chatham, N. Y., first prize, $5.
Jones Wilcox, East Chatham, N. Y., second prize, $3.

FRENCH — HOUDANS.

M. Ryan, Utica, N. Y., first prize, $5.
M. Ryan, Utica, N. Y., second prize, $3.

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CREVE-CŒURS.

J. M. Seymour, Clark's Mills, N. Y., first prize, $5.

LA FLECHE.

J. M. Seymour, Clark's Mills, N. Y., second prize, $3.

POLISH — BLACK POLISH.

William H. Underwood, East Scott, N. Y., first prize, $5.
D. A. Carter, Utica, N. Y., second prize, $3.

WHITE POLISH.

William H. Underwood, East Scott, N. Y., first prize, $5.

GOLDEN POLISH.

William H. Underwood, East Scott, N. Y., first prize, $5.
William H. Underwood, East Scott, N. Y., second prize, $3.

SILVER POLISH.

O. Howland & Son, Auburn, N. Y., first prize, $5.

GAMES — BLACK-BREASTED RED.

Worley C. Moat, Amsterdam, N. Y., first prize, $5.
H. W. Skerritt, Deansville, N. Y., second prize, $3.

SILVER DUCKWING.

F. J. Webber, Syracuse, N. Y., second prize, $3.

WHITE PILE.

William H. Underwood, East Scott, N. Y., second prize, $3.

OTHER APPROVED WELL-BRED GAMES.

Worley C. Moat, Amsterdam, N. Y., first prize, $5; Georgian.

BANTAMS — BLACK RED GAME.

Delos Wentworth, Mohawk, N. Y., second prize, $3.

RED PILE GAME.

F. J. Webber, Syracuse, N. Y., first prize. $5.
F. W. Gaylor, Nassau, N. Y., second prize, $3.

WHITE PILE GAME.

D. A. Carter, Utica, N. Y., first prize, $5.
F. J. Webber, Syracuse, N. Y., second prize, $3.

SILVER DUCKWING GAME.

D. A. Carter, Utica, N. Y., first prize, $5.
T. R. Proctor, Utica, N. Y., second prize, $3.

YELLOW DUCKWING GAME.

J. M. Seymour, Clark's Mills, N. Y., first prize, $5.

SILVER-LACED SEBRIGHTS.

O. Howland & Son, Auburn, N. Y., second prize, $3.

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GOLD-LACED SEBRIGHTS.

F. J. Webber, Syracuse, N. Y., first prize, $5.
Lizzie O. Ledyard, Cazenovia, N. Y., second prize, $3.

BLACK.

C. L. G. Blessing, Slingerlands, N. Y., second prize, $3.

TURKEYS, ETC.—BRONZE TURKEYS.

William H. Seeger, Colliers, N. Y., first prize, $5.
George Ayrault, Jr., Poughkeepsie, N. Y., second prize, $3.

WHITE TURKEYS.

Jones Wilcox, East Chatham, N. Y., first prize, $5.
William H. Seeger, Colliers, N. Y., second prize, $3.

PEARL GUINEA FOWLS.

O. Howland & Son, Auburn, N. Y., first prize, $3.
William H. Underwood, East Scott, N. Y., second prize, $2.

WHITE GUINEA FOWLS.

O. Howland & Son, Auburn, N. Y., second prize, $2.

GEESE — TOULOUSE.

William H. Seeger, Colliers, N. Y., second prize, $3.

EMBDEN.

N. Barns & Son, New Hartford, N. Y., first prize, $5.
Thomas W. Jones, Marcy, N. Y., second prize, $3.

WHITE CHINA.

William H. Seeger, Colliers, N. Y., first prize, $5.
William H. Underwood, East Scott, N. Y., second prize, $3.

BROWN CHINA.

Jones Wilcox, East Chatham, N. Y., first prize, $5.

WILD.

Thomas W. Jones, Marcy, N. Y., first prize, $5.
C. L. G. Blessing, Slingerlands, N. Y., second prize, $3.

DUCKS—ROUEN.

H. R. C. Watson, West Farms, N. Y., first prize, $5.
Thomas W. Jones, Marcy, N. Y., second prize, $3.

AYLESBURY.

William H. Underwood, East Scott, N. Y., first prize, $5.

CAYUGA.

J. M. Seymour, Clark's Mills, N. Y., first prize, $5.
O. Howland & Son, Auburn, N. Y., second prize, $3.

MUSCOVY.

Fred. S. Blessing, Slingerlands, N. Y., second prize, $3; white.

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PEKIN.

Jones Wilcox, East Chatham, N. Y., first prize, $5.
Jones Wilcox, East Chatham, N. Y., second prize, $3.

PIGEONS — POUTERS.

Mathias Cook, Utica, N. Y., first prize, $3, white.
Henry McPherson, Utica, N. Y., second prize, $2; white.

TUMBLERS.

Mathias Cook, Utica, N. Y., first prize, $3, kites.
Mathias Cook, Utica, N. Y., second prize, $2; black bearded.

BARBS.

Henry McPherson, Utica, N. Y., first prize, $3; yellow.

TURBITS, SOLID COLOUR.

C. L. G. Blessing, Slingerlands, N. Y., first prize, $3.
Mathias Cook, Utica, N. Y., second prize, $2.

TURBITS, WINGED.

C. L. G. Blessing, Slingerlands, N. Y., first prize, $3.
C. L. G. Blessing, Slingerlands, N. Y., second prize, $2.

OWLS, SOLID COLOUR.

Mathias Cook, Utica, N. Y., first prize, $3.
E. D. Withers, Ogdensburg, N. Y., second prize, $2.

FANTAILS.

Mathias Cook, Utica, N. Y., first prize, $3; white, blue-tailed.
E. D. Withers, Ogdensburg, N. Y., second prize, $2.

JACOBINS.

E. D. Withers, Ogdensburg, N. Y., first prize, $3.
C. L. G. Blessing, Slingerlands, N. Y., second prize, $2.

BLUE ROCKS.

Mathias Cook, Utica, N. Y., first prize, $3.
C. L. G. Blessing, Slingerlands, N. Y., second prize, $2.

DRAGOONS.

Mathias Cook, Utica, N. Y., first prize, $3.

ANTWERPS.

E. D. Withers, Ogdensburg, N. Y., first prize, $3.
Mathias Cook, Utica, N. Y., second prize, $2.

COLLECTIONS OF POUTERS.

Henry McPherson, Utica, N. Y., first prize, $5.
Mathias Cook, Utica, N. Y., second prize, $3.

COLLECTIONS OF TUMBLERS.

Mathias Cook, Utica, N. Y., first prize, $5.
Henry McPherson, Utica, N. Y., second prize, $3.

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COLLECTIONS OF FANCY PIGEONS.

Mathias Cook, Utica, N. Y., first prize, $5.
C. L. G. Blessing, Slingerlands, N. Y., second prize, $3.

COLLECTIONS OF TOY PIGEONS.

Mathias Cook, Utica, N. Y., first prize, $5.
C. L. G. Blessing, Slingerlands, N. Y., second prize, $3.

LOP-EARED OR MADAGASCAR RABBITS — SELF-COLOURED BUCKS.

Stephen Treen, Utica, N. Y., second prize, $2; bred by exhibitor.

SELF-COLOURED DOES.

Stephen Treen, Utica, N. Y., second prize, $2; bred by exhibitor.

BROKEN COLOURED BUCKS.

William A. Treen, Utica, N. Y., first prize, $3.

BROKEN COLOURED DOES.

William A. Treen, Utica, N. Y., first prize, $3.

COMMON — BUCKS.

Stephen Treen, Utica, N. Y., first prize, $2.

DOES.

Stephen Treen, Utica, N. Y., first prize, $2.

INCUBATORS IN OPERATION.

A. M. Halsted, Rye, N. Y., first prize, $10; Halsted's Patent Centennial Incubator.

ARTIFICIAL MOTHERS.

T. W. Gaylor, Nassau, N. Y., first prize, $10.

AWARDS FOR IMPLEMENTS, MACHINERY, AND MANUFACTURED ARTICLES.

EXHIBITED AT THE FORTY-SECOND ANNUAL CATTLE SHOW AND FAIR OF THE NEW YORK STATE AGRICULTURAL SOCIETY, AT UTICA, 1882.

NOTE.—The letters B. M. denote that a bronze medal was awarded; H. C. (highly commended) that the exhibitor is entitled to a certificate of highest merit; C. (commended) that the exhibitor is entitled to a certificate of merit. The numbers preceding the names are the catalogue numbers.

1739. E. B. Daniels & Co., Odessa, N. Y., Daniels' plough sulky. H. C.
1740. John Deere Plow Co., Rochester, N. Y., Gilpin sulky plough. H. C.
1743. The Dowagiac Manufacturing Co., Dowagiac, Mich., the Warner spring-tooth cultivatior; four machines in one, fallow cultivator, double and single corn cultivator and seeder. C. M.
1752. Kemp & Burpee Manufacturing Co., Syracuse, N. Y., Kemp's manure spreader. H. C.
1789½. Onondaga Road Scraper Co., Skaneateles, N.Y., Onondaga road scraper. C
1802. J. A. Cross, Fultonville, N. Y., hay conveyor track and pulleys. H. C.
1818. H. D. Herrington, Tiashoke, N. Y., potato digger. H. C.
1845. Ames Plow Co., Boston, Mass., Dr. Bailey's sixteen-inch ensilage machine, hand or power. B. M.
1851. H. W. Cornell, Owego, N. Y., corn sheller. H. C.

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1852. W. W. Crittenden, Phelps, N. Y., American pneumatic fruit evaporator. H. C.
1859. Johnson & Field, Racine, Wis., E. A. Egleston, agent, Albion, N. Y., farm fanning mills. C.
1860. Munson Brothers, Utica, N. Y., feed mills. H. C.
1867. E. W. Ross & Co., Fulton, N. Y., Ross's patent fodder and ensilage cutters. H C.
1872. D. W. Seeley, Albany N. Y., Buckman & Seeley's hay and cotton press. B. M.
1872½. Hiram Sibley & Co., Rochester, N. Y., improved feed gear for feed cutters. H. C.
1880. S. B. Van Duzee & Co., Gouverneur, N. Y., Bonanza fanning mill and separator. H. C.
1882. Victor Mower Co., Niverville, N. Y., friction ratchet for use on harvesting machines. C.
1884. Wheeler & Melick Co., Albany, N. Y., Champion rye thresher and cleaner. H. C.
1888. Alexander, Bradley & Dunning, Syracuse, N. Y., portable saw mill. H. C.
1889. J. H. Babcock, Phelps, N. Y., Babcock's reamer for iron-workers. C.
1891. Childs & Jones, Utica, N. Y., steam boiler and engine for dairy use. C.
1892. Empire Steam Pump Co., Carthage, N. Y., steam pumping engine. H. C.
1896. B. W. Payn & Son, Corning, N. Y., mounted threshing engine. H. C.
1907. Elias C. Schermerhorn, Alder Creek, N. Y., model of a thirty-block shingle machine. C.
1900. Chapin & Smith, Poultney, Vt., improved churn cover. H. C.
1914. N. G. Stebbins, Rome, N. Y., double-acting bellows for cooling and aerating milk, etc. C.
1915. J. M. Tallman, Utica, N. Y., the Daniels churn. C.
1920. T. V. Allis Manufacturing Co., Trenton, N. J., the Buckthorn solid steel barb fencing. C.
1924. Orrin A. Anthony, Mayfield, N. Y., patent lifting jack. C.
1925. Binghamton Scale Works, Binghamton, N. Y., hay and other scales. H. C.
1927. Boomer & Boschert Press Co., Syracuse, N. Y., power cider press. H. C.
1928. Boomer & Boschert Press Co., Syracuse, N. Y., power apple-grater. C.
1929. Buffalo Scale Co., Buffalo, N. Y., hay and other scales. H. C.
1934½. J. M. Childs & Co., Utica, N. Y., for display of dairy and other agricultural implements. H. C.
1935. M. J. Cook, Syracuse, N. Y., Eureka ash-sifter and safe and garbage barrow. C.
1936. D. J. & C. Davies, Utica, N. Y., the Howell steam washer. H. C.
1937. D. J. & C. Davies, Utica, N. Y., the Davies sudsing and rinsing machine. H. C.
1937½. Ballston Manufacturing Co., Ballston, N. Y., the Magic washer and mop wringer. C.
1938½. Lorillard Cover Co., Hornellsville, N. Y., box seat cover. H. C.
1940. Ralph L. Gazley, Utica, N. Y., wheelbarrow with attachments for gardening purposes. C.
1941. Goodell Co., Antrim, N. H., Bay State parer, corer and slicer. H. C.
1942. Goodell Co, Antrim, N. H., White Mountain parer, corer and slicer. H. C.
1944. J. M. Gray, Hamilton, N. Y., snow plow and road scraper combined. H. C.

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1955. C. Oyston, Little Falls, N. Y., nozzle and syringe. C.
1956½. Remington Agricultural Co., Ilion, N. Y., fire engine. H. C.
1960. Orrin A. Anthony, Mayfield, N. Y., steel-plated sleigh-shoe. H. C.
1963. L. W. Babcock, Whitesboro, N. Y., farm wagons. H. C.
1968. William F. Bidwell & Co., Troy, N. Y., buckboard wagons with Trojan spring. C.
1971. William F. Bidwell & Co., Troy, N. Y., the Trojan wagon-spring. C.
1972½ C. Russell Ross, Philadelphia, Penn., extra top jump-seat. H. C.
1976. Bradley & Co., Syracuse, N. Y., phaeton cart. H. C.
1981. J. M. Childs & Co., Utica, N. Y., Milburn farm wagons. H. C.
1982. J. M. Childs & Co., Utica, N. Y., harnesses. H. C.
1983. J. M. Childs & Co., Utica, N. Y., platform-spring and other light wagons and carriages. B. M.
1984. Cortland Wagon Co., Cortland, N. Y., general display of their vehicles. Silver medal.
1686. Excelsior Top Co., Cortland, N. Y., seat cushions and backs and dashboards for wagons. C.
1987. The Harris Manufacturing Co., Hornellsville, N. Y., Harris' patent carriage seat. C.
1990. Lyons Manufacturing Co., Syracuse, N. Y., road wagons. H. C.
1992. H. A. Moyer, Syracuse, N. Y., Moyer's patent side-spring and side-bar wagons. H. C.
1994. Palmatier Spring Co., Leeds, N. Y., spiral bolster and axle springs for wagons. C.
1996. P. O. Risley, Ilion, N. Y., light sleighs. H. C.
1997. Rome Spring Wagon Co., Rome, N. Y., platform spring wagons. H. C.
2001. Short & Smith, Syracuse, N. Y., Brewster spring top road wagons. H. C.
2007. Short & Smith, Syracuse, N. Y., light Portland sleigh. C.
2008. G. A. Struppler, Elmira, N. Y., tire upsetting machine. C.
2013. W. B. Billings, Westmoreland, N. Y., combination cooker, baker and broiler. C.
2104. L. Dean, Utica, N. Y., useful and ornamental iron work. H. C.
2106. Austin Devoe, Geneva, N. Y., wooden telephone. C.
2126. T. F. McBride, Whitestown, N. Y., feather renovator. H. C.
2130. Price & Knickerbocker, Albany, N. Y., display of field, garden and flower seeds, etc. H. C.
2131. Hiram Sibley & Co., Rochester, N. Y., display of agricultural implements, seeds, ornamental grasses, etc. H. C.

FARM PRODUCE.

GRAIN, SEEDS, HOPS, GROWN IN 1882.—WHITE WINTER WHEAT.

William Watson, Jr., Whitestown, N. Y., first prize, $10.
W. H. Pearce, New Hartford, N. Y., second prize, $5.

RED WINTER WHEAT.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $10.
A. M. Potter, Ridge Mills, N. Y., second prize, $5.

SPRING WHEAT.

George Campbell, Green's Landing, Penn., first prize, $10; Russian.

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WINTER RYE.

George Campbell, Green's Landing, Penn., first prize, $10; Australian.
E. Van Allen, Bethlehem Centre, N. Y., second prize, $5.

SPRING RYE.

Philip C. Van Allen, Slingerlands, N. Y., first prize, $10.
E. Van Allen, Bethlehem Centre, N. Y., second prize, $5.

WHITE OATS.

George Campbell, Green's Landing, Penn., first prize, $10; English Challenge.
Myron F. Pierson, Seneca Castle, N. Y., second prize, $5; New Australian.

BLACK OR GRAY OATS.

George Campbell, Green's Landing, Penn., first prize, $10; Black Tartarian.
C. L. G. Blessing, Slingerlands, N. Y., second prize, $5.

WINTER BARLEY.

C. L. G. Blessing, Slingerlands, N. Y., second prize, $5.

TWO-ROWED SPRING BARLEY.

George Campbell, Green's Landing, Penn., first prize, $10; Kinver's Chevalier.
Stryker & Jones, Rome, N. Y., second prize, $5.

FOUR-ROWED SPRING BARLEY.

George Campbell, Green's Landing, Penn., first prize, $10; Canada.
William Harrison Smith, Geneva, N. Y., second prize, $5.

YELLOW INDIAN CORN (SHELLED)

Philip C. Van Allen, Slingerlands, N. Y., first prize, $10.

LARGE FIELD BEANS.

Fred S. Blessing, Slingerlands, N. Y., second prize, $5.

SMALL FIELD BEANS.

L. L. French, Richfield Springs, N. Y., second prize, $5.

LARGE FIELD PEAS.

Philip C. Van Allen, Slingerlands, N. Y., second prize, $5.

SMALL FIELD PEAS.

C. L. G. Blessing, Slingerlands, N. Y., second prize, $5.

BUCKWHEAT.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $5.
Washington Garlock, Utica, N. Y., second prize, $3.

TIMOTHY SEED.

Delos Wentworth, Mohawk, N. Y., first prize, $5.
Madison Goulding, Pamelia, N. Y., second prize, $3.

MILLET.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $5.
Fred S. Blessing, Slingerlands, N. Y., second prize, $3.

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SORGHUM SEED.

Myron F. Pierson, Seneca Castle, N. Y., first prize, $5; Kearney's improved.
Philip C. Van Allen, Slingerlands, N. Y., second prize, $3.

SEED EARS OF YELLOW CORN, EIGHT-ROWED.

Fred S. Blessing, Slingerlands, N. Y., first prize, $5.
Philip C. Van Allen, Slingerlands, N. Y., second prize, $3.

SEED EARS OF YELLOW CORN, TWELVE-ROWED.

Jones Wilcox, East Chatham, N. Y., first prize, $5.
W. A. & J. F. Barns, Kirkland, N. Y., second prize, $3.

SEED EARS OF WHITE CORN.

Philip C. Van Allen, Slingerlands, N. Y., first prize, $5.
Fred S. Blessing, Slingerlands, N. Y., second prize, $3.

SEED EARS OF DENT CORN.

George Campbell, Green's Landing, Penn., first prize, $10.
Myron F. Pierson, Seneca Castle, N. Y., second prize, $5; Pride of the North.

SEED EARS OF EARLY SWEET CORN.

E. Van Allen, Bethlehem Centre, N. Y., first prize. $5.
Philip C. Van Allen, Slingerlands, N. Y., second prize, $3.

SEED EARS OF LATE SWEET CORN.

A. M. Potter, Ridge Mills, N. Y., first prize, $5.
Stryker & Jones, Rome, N. Y., second prize, $3.

HOPS.

William H. Seeger, Colliers, N. Y., first prize, $10.

VEGETABLES — CELERY.

T. R. Proctor, Utica, N. Y., first prize, $3.
William A. Treen, Utica, N. Y., second prize, $2.

CAULIFLOWERS.

Michael Torpy, Utica, N. Y., first prize, $3.

CABBAGES.

Michael Torpy, Utica, N. Y., first prize, $3.

LETTUCE.

T. R. Proctor, Utica, N. Y., first prize, $3.

TURNIPS.

W. A. & J. F. Barns, Kirkland, N. Y., first prize, $3.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $2.

MANGOLDS.

S. A. Cleveland, New Hartford, N. Y., first prize, $3.
Harvey Wood, West Schuyler, N. Y., second prize, $2.

BEETS.

Michael Torpy, Utica, N. Y., first prize, $3.

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ORANGE CARROTS.

William A. Treen, Utica, N. Y., first prize, $3.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $2.

WHITE CARROTS.

Philip C. Van Allen, Slingerlands, N. Y., first prize, $3.
E. Van Allen, Bethlehem Centre, N. Y., second prize, $2.

PARSNIPS.

S. A. Cleveland, New Hartford, N. Y., first prize, $3.
Michael Torpy, Utica, N. Y., second prize, $2.

SALSIFY.

S. A. Cleveland, New Hartford, N. Y., first prize, $3.
William A. Treen, Utica, N. Y., second prize, $2.

KOHL-RABI.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $3.
E. Van Allen, Bethlehem Centre, N. Y., second prize, $2.

ONIONS.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $3.
Myron F. Pierson, Seneca Castle, N. Y., second prize, $2.

TOMATOS.

Michael Torpy, Utica, N. Y., first prize, $3.
E. Van Allen, Bethlehem Centre, N. Y., second prize, $2.

EGG PLANT

E. Van Allen, Bethlehem Centre, N. Y., first prize, $3.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $2.

GARDEN BEANS.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $3.
Myron F. Pierson, Seneca Castle, N. Y., second prize, $2.

PEPPERS

E. Van Allen, Bethlehem Centre, N. Y., first prize, $3.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $2.

SQUASHES.

Michael Torpy, Utica, N. Y., first prize, $3.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $2.

PUMPKINS.

Philip C. Van Allen, Slingerlands, N. Y. first prize, $3.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $2.

SWEET POTATOES.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $3.

POTATOES — EXHIBITIONS OF EARLY VARIETIES.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $10.
Myron F. Pierson, Seneca Castle, N. Y., second prize, $5

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EXHIBITIONS OF LATE VARIETIES.

William H. Underwood, East Scott, N. Y., first prize, $10.
William Hollis, Jr., Sherburne, N. Y., second prize, $5.

EXHIBITIONS OF STOCK-FEEDING VARIETIES.

Oscar J. Lewis, Schodack Centre, N. Y., first prize, $10.
Myron F. Pierson, Seneca Castle, N. Y., second prize, $5.

COLLECTIONS OF VEGETABLES.

Oscar J. Lewis, Schodack Centre, N. Y. (half), $12.50.
E. Van Allen, Bethlehem Centre, N. Y. (half), $12.50.

BUTTER — SPECIAL PRIZE FOR THE BEST SIX PACKAGES, NOT LESS THAN 30 LBS. NET EACH, MADE IN THE SAME CREAMERY OR PRIVATE DAIRY.

West Lisbon Gilt Edge Creamery, Ogdensburg, N. Y., Henry & Erwin, proprietors, $50.

PACKAGES MADE IN JUNE IN CREAMERY.

George W. Kinney, Stanwix, N. Y., first prize, $30.
Risley Bros., New York Mills, N. Y., second prize, $20.

PACKAGES MADE AT ANY TIME IN CREAMERY.

West Libson Gilt Edge Creamery, Ogdensburg, N. Y., Henry & Erwin, proprietors, first prize, $30.
Risley Bros., New York Mills, N. Y., second prize, $20.
George W. Kinney, Stanwix, N. Y., third prize, $10.

PACKAGES MADE IN JUNE IN PRIVATE DAIRY.

W. F. Ford, West Davenport, N. Y., first prize, $30.
Delos Wentworth, Mohawk, N. Y., second prize, $20.
O. B. Sheaf, East Schuyler, N. Y., third prize, $10.

PACKAGES MADE AT ANY TIME IN PRIVATE DAIRY.

A. B. Cary, West Winfield, N. Y., first prize, $30.
Morgan Wood & Bro., West Martinsburgh, N. Y., second prize, $20.
Madison Goulding, Pamelia Four Corners, N. Y., third prize, $10.

MOULDS OR ROLLS.

L. W. Ledyard, Cazenovia, N. Y., first prize, $10.
W. L. & W. Rutherford, Waddington, N. Y., second prize, $5.

CHEESE — SPECIAL PRIZE FOR THE BEST DOZEN CHEESES, NOT LESS THAN 20 LBS. EACH, FROM THE SAME FACTORY OR DAIRY, AND SUITABLE FOR ARMY AND OTHER USES.

George R. Wright, Whitestown, N. Y., $50.

AMERICAN CHEESE OVER FIVE YEARS OLD.

W. H. Spooner, Walworth, N. Y., first prize, $30.

AMERICAN CHEESE OVER ONE YEAR OLD.

W. H. Spooner, Walworth, N. Y., first prize, $30.

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American Cheeses less than One Year Old.

F. L. Jones, Utica, N. Y., first prize, $30.
L. L. Wight, Whitesboro, N. Y., second prize, $20.
Hugh Davis, West Winfield, N. Y., third prize, $10.

Bread, Sugar, etc. — Wheaten Bread.

Lizzie O. Ledyard, Cazenozia, N. Y., first prize, $5.
E. Van Allen, Bethlehem Centre, N. Y., second prize, $3.

Rye Bread.

Mrs. M. J. Chittenden, Clark's Mills, N. Y., first prize, $5.
Mrs. A. J. Douglass, Ilion, N. Y., second prize, $3.

Indian, or Rye and Indian, Bread.

A. M. Potter, Ridge Mills, N. Y., first prize, $5.
Stryker & Jones, Rome, N. Y., second prize, $3.

Maple Sugar.

W. F. Ford, West Davenport, N. Y., first prize, $5.

Maple Syrup.

W. F. Ford, West Davenport, N. Y., first prize, $5.
Mrs. L. S. Wentworth, Mohawk, N. Y., second prize, $3.

Preserved Fruits.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $5.
Oscar J. Lewis, Schodack Centre, N. Y., second prize, $3.

Pickles.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $5.
Mrs. Seth Bonfoy, West Winfield, N. Y., second prize, $3.

Dried Apples.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $5.
M. H. Tennant, Rome, N. Y., second prize, $3.

Dried Whortleberries.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $5.

Dried Raspberries.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $5.
Mrs. S. M. Williams, Taberg, N. Y., second prize, $3.

Box Honey.

F. W. Gaylor, Nassau, N. Y., second prize, $3.

Extracted or Strained Honey.

M. H. Tennant, Rome, N. Y., first prize, $5.

DOMESTIC MANUFACTURES.

Woolen Blankets.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $5.
Mrs. C. Berk, Fassett, Penn., second prize, $3.

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ALL WOOL HORSE BLANKETS.

M. H. Tennant, Rome, N. Y., first prize, $5.
Mrs. L. S. Wentworth, Mohawk, N. Y., second prize, $3.

WOOLEN CLOTH.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $5.
S. A. Sheaf, Frankfort, N. Y., second prize, $3.

WOOLEN FLANNEL.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $5.
Mrs. S. M. Williams, Taberg, N. Y., second prize, $3.

WOOLEN AND COTTON FLANNEL.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $5.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $3.

LINSEY WOOLSEY.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $5.
Mrs. S. M. Williams, Taberg, N. Y., second prize, $3.

COTTON AND WOOL KERSEY.

Mrs. L. S. Wentworth, Mohawk, N. Y., first prize, $5.
Mrs. S. M. Williams, Taberg, N. Y., second prize, $3.

WOOLEN CARPET.

Mrs. C. Berk, Fassett, Penn., first prize, $5.

RAG CARPET.

Mrs. A. J. Douglass, Ilion, N. Y., first prize, $5.
Mrs. M. J. Chittenden, Clark's Mills, N. Y., second prize, $3.

HEARTH RUGS.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $5.
Mrs. A. J. Douglass, Ilion, N. Y., second prize, $3.

DOUBLE CARPET COVERLETS.

S. A. Sheaf, Frankfort, N. Y., first prize, $5.
Mrs. S. M. Williams, Taberg, N. Y., second prize, $3.

LINEN CLOTH.

Mrs. Seth Benfoy, West Winfield, N. Y., first prize, $5.
Mrs. William H. Graves, Blossvale, N. Y., second prize, $3.

LINEN KERSEY.

Mrs. S. M. Williams, Taberg, N. Y., first prize, $5.
Mrs. William H. Graves, Blossvale, N. Y., second prize, $3.

TOW CLOTH.

Mrs. S. M. Williams, Taberg, N. Y., second prize, $3.

KNIT BED SPREADS.

Fannie E. Hubbard, Paris, N. Y., first prize, $3.
Miss Franc R. Loomis, Solsville, N. Y., second prize, $2.

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WHITE WORKED OR QUILTED BED SPREADS.

Mrs. E. J. Millard, Utica, N. Y., first prize, $3.
Mrs. G. H. F. Van Horne, Fonda, N. Y., second prize, $2; silk.

COTTON BED QUILTS.

Mrs. S. B. Goodsell, Bartlett, N. Y., first prize, $3.
Miss Franc R. Loomis, Solsville, N. Y., second prize, $2.

BALMORAL PETTICOATS.

Mrs. S. M. Williams, Taberg, N. Y., first prize, $3.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $2.

WOOLEN KNIT STOCKINGS.

M. H. Tennant, Rome, N. Y., first prize, $3.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $2.

WORSTED KNIT STOCKINGS.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $3.
M. H. Tennant, Rome, N. Y., second prize, $2.

WOOLEN KNIT MITTENS.

Jones Wilcox, East Chatham, N. Y., first prize, $3.
E. Van Allen, Bethlehem Centre, N. Y., second prize, $2.

WOOLEN FRINGE MITTENS.

Mrs. W. H. Graves, Blossvale, N. Y., first prize, $3.
M. H. Tennant, Rome, N. Y., second prize, $2.

LINEN, OR COTTON, KNIT STOCKINGS.

M. H. Tennant, Rome, N. Y., first prize, $3.
Mrs. W. H. Graves, Blossvale, N. Y., second prize, $2.

LINEN SEWING THREAD.

Mrs. S. M. Williams, Taberg, N. Y., first prize, $3.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $2.

EXTRA AWARDS.

Mrs. W. B. Smith, Utica, N. Y., black silk mittens, $2.
Mrs. Lydia A. J. Gray, Utica, N. Y., embroidered work, $5.

FLOWERS.

PROFESSIONAL LIST.—EXHIBITIONS OF CUT FLOWERS.

James Vick, Rochester. N. Y., first prize, $10.

COLLECTIONS OF DAHLIAS.

James Vick, Rochester, N. Y., first prize, $6.

TWENTY-FOUR DAHLIAS.

James Vick, Rochester, N. Y., first prize, $5.

TWELVE DAHLIAS.

James Vick, Rochester, N. Y., first prize, $3.

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AMERICAN SEEDLING DAHLIAS.

James Vick, Rochester, N. Y., first prize, $1.

COLLECTIONS OF ANNUAL PHLOXES.

James Vick, Rochester, N. Y., first prize, $5.

SEEDLING PHLOXES.

James Vick, Rochester, N. Y., first prize, $1.

COLLECTIONS OF VERBENAS.

James Vick, Rochester, N. Y., first prize, $5.
George H. Boice, Utica, N. Y., second prize, $3.

TWELVE VARIETIES OF VERBENAS.

James Vick, Rochester, N. Y., first prize, $3.

AMERICAN SEEDLING VERBENAS

James Vick, Rochester, N. Y., first prize, $1.

COLLECTIONS OF ASTERS.

James Vick, Rochester, N. Y., first prize, $3.

COLLECTIONS OF LILIES.

James Vick, Rochester, N. Y., first prize, $3.

COLLECTIONS OF PANSIES.

John Alexander, Utica, N. Y., first prize, $3.

COLLECTIONS OF GLADIOLUS.

James Vick, Rochester, N. Y., first prize, $3.

TWELVE VARIETIES OF GLADIOLUS.

James Vick, Rochester, N. Y., first prize, $2.

AMATEUR LIST—EXHIBITIONS OF CUT FLOWERS.

M. H. Tennant, Rome, N. Y., first prize, $10.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $5.

COLLECTIONS OF DAHLIAS.

M. H. Tennant, Rome, N. Y., first prize, $6.
A. A. Stone, Stanwix, N. Y., second prize, $3.

TWELVE DAHLIAS.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $3.
M. H. Tennant, Rome, N. Y., second prize, $2.

SIX DAHLIAS.

A. A. Stone, Stanwix, N. Y., first prize, $2.
M. H. Tennant, Rome, N. Y., second price, $1.

COLLECTIONS OF ROSES.

M. H. Tennant, Rome, N. Y., first prize, $6.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $3.

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COLLECTIONS OF VERBENAS.

M. H. Tennant, Rome, N. Y., first prize, $5.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $3.

TWELVE VARIETIES OF VERBENAS.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $3.
M. H. Tennant, Rome, N. Y., second prize, $2.

SIX VARIETIES OF VERBENAS.

M. H. Tennant, Rome, N. Y., first prize, $2.
Miss L. P. Tennant, Stanwix N. Y., second prize, $1.

COLLECTIONS OF PHLOXES.

Miss L. P. Tennant, Stanwix, N.Y., first prize, $5.
M. H. Tennant, Rome, N. Y., second prize, $3.

PERENNIAL PHLOXES.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $2.
M. H. Tennant, Rome, N. Y., second prize, $1.

COLLECTIONS OF ASTERS.

M. H. Tennant, Rome, N. Y., first prize, $3.
C. L. G. Blessing, Slingerlands, N. Y., second prize, $2.

COLLECTIONS OF PANSIES.

M. H. Tennant, Rome, N. Y., first prize, $3.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $2.

TEN WEEKS' STOCKS.

M. H. Tennant, Rome, N. Y., first prize, $3.
Miss L. P. Tennant, Stanwix, N. Y., second prize, $2.

COLLECTIONS OF GLADIOLUS.

Miss L. P. Tennant, Stanwix, N. Y., first prize, $3.
M. H. Tennant, Rome, N. Y., second prize, $2.

TWELVE VARIETIES OF GLADIOLUS.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $2.
M. H. Tennant, Rome, N. Y., second prize, $1.

EVERLASTING FLOWERS.

E Van Allen, Bethlehem Centre, N. Y., first prize, $3.
M H. Tennant, Rome, N. Y., second prize, $2.

GENERAL LIST, OPEN TO ALL COMPETITORS — COLLECTIONS OF POT PLANTS.

H. D. Roth, Utica, N. Y., first prize, $15.
John Alexander, Utica, N. Y., second prize, $10.

TWENTY GREENHOUSE AND STOVE PLANTS.

William Matthews, Utica, N. Y., first prize, $10.
George W. Boice, Utica, N. Y., second prize, $5.

GROUPS OF PALMS.

John Alexander, Utica, N. Y., first prize, $8.

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SINGLE VARIEGATED LEAVED PLANTS.

George W. Boice, Utica, N. Y., first prize, $2.

BUTTON-HOLE BOUQUETS.

George W. Boice, Utica, N. Y., first prize, $3.
E. Van Allen, Bethlehem Centre, N. Y., second prize, $2.

BASKETS OF FLOWERS.

John Alexander, Utica, N. Y., first prize, $5.
William Matthews, Utica, N. Y., second prize, $3.

FLORAL DESIGNS.

George W. Boice, Utica, N. Y., first prize, $5.

FRUITS.

PROFESSIONAL LIST — COLLECTIONS OF APPLES.

Washington Garlock, Utica, N. Y., second prize, $8.

COLLECTIONS OF PEARS.

Ellwanger & Barry, Rochester, N. Y., first prize, $15.

TWENTY VARIETIES OF PEARS.

Ellwanger & Barry, Rochester, N. Y., first prize, $10.

ONE VARIETY OF PEACHES.

J. S. Stone, Charlotte, N. Y., first prize, $3.

COLLECTIONS OF PLUMS.

Ellwanger & Barry, Rochester, N. Y., first prize, $5.

ONE VARIETY OF PLUMS.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

QUINCES.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

NATIVE GRAPES.—TEN VARIETIES OF GRAPES.

Ellwanger & Barry, Rochester, N. Y., first prize, $10.
James H Ricketts, Newburgh, N. Y., second prize, $5.

FIVE VARIETIES OF GRAPES.

James H. Ricketts, Newburgh, N. Y., first prize, $5.
Ellwanger & Barry, Rochester, N. Y., second prize, $3.

FOREIGN GRAPES GROWN UNDER GLASS.— TEN VARIETIES OF GRAPES.

Ellwanger & Barry, Rochester, N. Y., first prize, $10.

THREE BUNCHES OF BLACK GRAPES.

James H. Ricketts, Newburgh, N. Y., first prize, $2.

AMATEUR LIST.— COLLECTIONS OF APPLES.

Jacob Houck, New Hartford, N. Y., second prize, $5.

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TEN VARIETIES OF APPLES.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $5.
Albert S. Glatt, New York Mills, N. Y., second prize, $3.

FIVE VARIETIES OF APPLES.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $3.
Jacob Houck, New Hartford, N. Y., second prize, $2.

COLLECTIONS OF PEARS.

M. E. Myers, Charlton, N. Y., first prize, $5.

FIVE VARIETIES OF PEARS.

M. E. Meyers, Charlton, N. Y., first prize, $3.

QUINCES.

J. S. Stone, Charlotte, N. Y., first prize, $2.

FRUITS, SINGLE DISHES, OPEN TO ALL.— APPLES.— BALDWIN.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $2.

KING OF TOMPKINS COUNTY.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $2.

NORTHERN SPY.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $2.

RHODE ISLAND GREENING.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $2.

ROXBURY RUSSET.

W. A. & J. F. Barns, Kirkland, N. Y., first prize, $2.

TWENTY OUNCE.

J. S. Stone, Charlotte, N. Y., first prize, $2.

ESOPUS SPITZENBURG.

E. Van Allen, Bethlehem Centre, N. Y., first prize, $2.

PEARS — BARTLETT.

M. E. Myers, Charlton, N. Y., first prize, $2.

BEURRE D'ANJOU.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

BEURRE CLAIRGEAU.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

BEURRE BOSC.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

DUCHESSE D'ANGOULEME.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

DOYENNE BOUSSOCK.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

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FLEMISH BEAUTY.

J. S. Stone, Charlotte, N. Y., first prize, $2.

SECKEL.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

SHELDON.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

LAWRENCE.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

WINTER NELIS.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

GRAPES.— CONCORD.

O. J. Tillson, Highland, N. Y., first prize, $2.

DELAWARE.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

HARTFORD.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

ANY OF ROGERS' VARIETIES.

Ellwanger & Barry, Rochester, N. Y., first prize, $2.

EXTRA AWARD.

T. G. Burrow, Fishkill, N. Y., $5; thirteen varieties of out-door grapes.

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COUNTY AGRICULTURAL SOCIETIES.

Abstract of Treasurers' Reports.

1877.

COUNTY.	Balance from 1876.	Receipts.	Prem'ms paid.	Expenses.	Balance to 1878.	Remarks.
Albany	... ...	.....	.....	.....	... ...	
Allegany	.....	.....	.....	.....	.....	
Broome	$613 71	$2,815 56	$1,640 95	$1,683 16	$105 16	$541; perm't improv'ts.
Cattaraugus	99 94	1,594 01	750 44	860 00	83 15	
Cayuga	65 62	5,849 61	1,216 52	4,662 00	26 71	Purse, $520.
Chautauqua	371 64	3,805 92	1,789 99	2,295 02	92 55	Purses, $135; permanent improvem'ts, $1,561.67.
Chemung	469 88	1,413 59	803 90	429 86	649 71	
Chenango	83 65	1,394 67	575 55	543 64	3 9 13	
Clinton	.....	.....	.....	.....	.....	
Columbia	137 76	1,727 92	499 50	944 85	421 33	Purses, $680.
Cortland	687 82	1,986 41	1,918 34	630 12	15 77	
Delaware	.....	1,625 73	813 00	1,171 55	358 82	Perm't improv't, $432.64.
Dutchess	.....	2,442 69	1,362 75	1,077 44	2 50	
Erie	101 18	2,813 26	1,138 70	1,499 51	276 23	Purses, $528.
Essex	464 71	1,116 56	452 25	696 05	432 97	Purses, $900.
Franklin	13 05	2,406 98	986 45	1,428 80	5 23	Pur. $881; in. on d'bt $140
Fulton	36 73	2,098 35	1,142 00	895 16	97 91	Purses, $287 50.
Genesee	.....	.....	.....	.....	.....	
Greene	708 43	1,719 32	1,244 13	667 48	511 14	
Herkimer	.....	.....	.....	.....	.....	
Jefferson	.....	.....	.....	.....	.....	
Lewis	208 79	2,585 76	1,010 75	1,563 28	170 57	Perm't improv't, $434 15; int. on debt, $388.03.
Livingston	29 63	2,169 25	1,241 00	773 08	185 80	
Monroe (W.N.Y A.S.)	166 39	809 07	.....	816 72	158 74	No fair.
Montgomery	815 83	2,659 77	268 00	1,444 00	1,763 60	
New York (Am. Ins)	1,555 98	33,818 41	347 10	32,514 74	2,512 55	
Niagara	642 80	2,577 80	1,204 62	845 61	115 33	Pur. $590; in. on d'bt $294
Oneida	376 19	3,834 99	2,047 90	1,486 67	676 61	Purses, $705.
Ontario	1,158 83	2,874 35	1,151 80	1,025 25	1,889 26	Purses, $130.
Orange	.....	1,780 00	1,108 00	452 66	219 34	
Orleans	246 38	2,091 98	744 75	1,058 95	534 66	
Oswego	11	2,562 53	1,680 20	1,787 34	904 90	
Otsego	7 02	3,997 38	1,571 67	2,223 93	208 80	Paid note & int. $1,225 87
Putnam	.....	1,143 38	692 08	451 30	.....	Purses, $395.
Queens	3,007 33	9,201 38	3,813 00	4,359 29	4,036 32	
Rockland	.....	.....	.....	.....	.....	
St. Lawrence	1,078 59	4,458 42	1,188 00	2,568 38	376 55	Purses, $1,080.
Saratoga	18 68	1,606 54	495 00	1,043 84	49 02	Paid on debt, $334.88.
Schenectady	144 07	1,582 68	731 00	647 67	223 08	
Schoharie	46 43	2,112 12	474 00	1,676 71	7 84	Purses, $290; paid on mortgage, $1,017 15.
Schuyler	192 79	815 04	297 90	691 03	18 90	Paid on mt'ge, $456.75.
Seneca	482 79	1,430 53	603 65	822 14	487 53	
Steuben	80 96	3,274 43	1,276 25	1,526 88	552 26	$552, perm't improv'ts.
Sullivan	.....	556 07	173 25	375 85	6 97	
Suffolk	135 79	2,461 40	809 00	1,757 01	31 18	Paid on mortgage, $973.
Tioga	182 51	1,232 54	506 00	574 90	40 87	
Tompkins	95 74	1,957 05	509 50	1,249 76	293 53	Paid de't and int. $781.38.
Ulster	8 74	350 00	.....	.....	358 74	No fair.
Warren	430 45	2,660 86	1,203 00	822 09	1,066 22	Purses, $294.
Washington	*	4,855 90	1,396 75	3,294 05	165 10	
Wayne	7 48	988 83	238 75	670 01	87 55	Paid on mt'ge, $472.59.
Wyoming	5 61	2,006 61	1,115 00	891 04	6 18	
Yates	8 95	2,015 24	574 50	1,488 16	88 74	P'd on mtg. & int. $1,095.
MADISON COUNTY TOWN SOCIETIES, Etc.						
Brookfield	$44 27	$1,042 86	$428 16	$452 48	$206 49	
Hamilton	733 41	486 67	315 20	270 28	634 60	
Lenox	.....	2,884 00	976 00	1,885 33	23 54	Purses, $105; balloonist, $300; land, $1,200.

* Old balance carried to surplus fund.

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COUNTY AGRICULTURAL SOCIETIES — (*Continued*).

ONONDAGA COUNTY TOWN SOCIETIES.

TOWNS.	Balance from 1876.	Receipts.	Prem'ms paid.	Expenses.	Balance to 1878.	Remarks.
Clay	$55 53	$494 45	$285 00	$93 10	$116 35	
Manlius Pompey	103 45	1,113 40	520 25	406 65	288 95	
Marcellus	19 66	196 98	.....	56 06	160 53	No cash premium awards
Onondaga	75 35	446 08	166 60	164 00	190 83	
N. W Onondaga	37 83	1,717 13	445 90	998 75	310 31	Purse, $120; bal'nist, $200
Phoenix Union	9 81	1,394 00	732 20	637 94	33 67	Purses, $225.
Skaneateles	339 03	394 17	159 00	114 87	459 33	
Spafford	.....	.....	.....	.....	.....	
Thorn Hill	112 25	125 52	61 00	57 77	119 00	

INDIAN AGRICULTURAL SOCIETIES.

Cattarangus	....	$1,693 34	$856 75	$732 87	$102 72	
Onondaga	.....	458 91	189 00	128 25	126 66	Purses, $65.
Tonawanda	.....	506 16	444 50	61 66	.....	Purses, $225.

COUNTY AGRICULTURAL SOCIETIES.

1878.

COUNTIES.	Balance from 1877.	Receipts.	Prem'ms paid.	Expenses.	Balance to 1879.	Remarks.
Allegany	$64 37	$1,488 46	$525 00	$725 16	$302 67	
Broome	105 16	3,468 47	1,786 84	1,761 79	25 00	Includes $325 permanent improvements.
Cattaraugus	88 51	1,820 11	790 75	961 18	151 69	
Cayuga	26 71	2,737 47	954 50	1,594 87	214 81	Purses, $285.
Chautauqua	92 55	3,341 08	1,830 00	1,630 84	17 21	Purses, $240.
Chemung	.....	.....	....	.....	.....	No fair; State fair held at Elmira this year.
Chenango	379 86	977 81	604 00	363 26	16 10	
Clinton	.....	.....	.....	.....	.....	
Columbia	421 33	1,659 01	922 00	617 35	533 99	Purses, $390.
Cortland	34 46	1,771 29	103 17	1,682 13	20 38	Purses, $936.53.
Delaware	13 31	1,360 38	667 50	581 78	124 41	
Dutchess	.....	2,961 59	1,387 75	1,296 19	277 65	
Erie	276 23	2,265 40	1,327 50	676 11	538 02	Purses, $184.
Essex	432 97	1,353 33	716 37	518 24	551 69	Purses, $303.
Franklin	5 23	4,880 39	2,973 00	1,841 98	70 64	Purses $1,445; Col. Ingersoll's address, $500.
Fulton	97 91	4,044 94	2,218 50	1,854 36	69 99	Purses, $355.
Genesee	100 00	1,740 43	1,169 25	663 59	7 59	
Greene	511 14	2,175 89	1,130 00	530 00	1,027 03	Purses, $345.
Herkimer	12 15	2,572 64	1,287 50	1,015 50	281 79	Purses, $170; old debt, $358.88.
Jefferson	.....	5,315 13	3,242 00	2,012 79	60 34	Purses, $1,330.
Lewis	170 57	2,417 27	863 75	1,592 89	131 20	Mtge. and int, $475.20.
Livingston	185 80	2,161 45	1,132 75	1,206 90	8 36	
Monroe (W.N.Y.A.S.)	158 72	7,068 77	4,045 00	3,182 49	.....	Purses, $800.
Montgomery	897 00	1,760 02	1,095 40	1,261 98	299 64	
New York (Am. Ins.)	2,512 55	27,334 23	900 00	22,751 74	6,195 04	
Niagara	115 23	3,133 09	927 50	1,688 35	452 01	
Oneida	676 61	5,899 58	1,986 00	4,321 65	268 54	Purses, $605; permanent impr'ments, $3,121.45.
Onondaga	.....	11,186 37	990 00	6,945 71	3,250 66	Includes permanent improvements, $5,686.96.
Ontario	1,955 59	3,315 46	1,057 83	4,111 96	169 09	Includes $3,540 permanent improvements.
Orange	219 34	1,764 24	1,238 00	513 86	231 72	
Orleans	584 66	2,049 06	796 00	773 96	1,014 66	
Oswego	904 90	2,307 09	1,430 75	1,883 06	906 72	
Otsego	208 80	3,924 13	1,774 25	2,330 48	28 20	Purses, $325.
Putnam	.....	1,716 28	833 25	851 96	31 00	Purses, $240.
Queens	4,036 33	10,112 17	4,487 90	9,181 55	479 04	Permau't imp. $4,156.64.
Rockland	.....	1,139 23	505 38	628 50	5 34	
St. Lawrence	28 84	5,060 44	3,491 25	1,553 20	12 85	Purses, $2,195.
Saratoga	49 02	2,045 19	963 50	1,064 70	77 01	Purses, $142.50.
Schenectady	223 06	1,115 92	724 25	477 84	136 91	
Schoharie	7 84	2,218 58	786 00	1,212 05	228 31	Purses, $250; old debts, $710.
Schuyler	18 94	415 79	225 00	194 85	14 88	
Seneca	487 53	1,794 94	732 50	1,027 01	462 96	
Steuben	552 26	3,435 58	1,469 00	2,478 71	90 13	Includes mortgage and interest, $1,477.

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COUNTY AGRICULTURAL SOCIETIES — (*Continued*).

COUNTIES.	Balance from 1877.	Receipts.	Prem'ms paid.	Expenses.	Balance to 1879.	Remarks.
Sullivan	$7 06	$533 84	$226 75	$353 09	$38 94	Permanent imp., $200.
Suffolk	31 18	2,120 44	933 00	1,224 11	4 51	Mortgage, $400.
Tioga	52 30	1,488 67	535 47	758 20	142 70	
Tompkins	293 53	1,672 64	683 75	1,191 02	81 40	$778.39 mort. and int.
Ulster	.....	.....	.....	.....	.....	No fair.
Warren	1,066 22	2,651 19	1,350 25	1,349 79	1,017 37	Purses, $285.
Washington	†	4,947 69	1,523 50	2,644 02	599 63	
Wayne	87 55	988 65	349 35	302 04	384 81	
Wyoming	6 18	1,684 44	1,022 00	644 21	34 41	
Yates	38 47	1,910 44	691 00	1,166 22	53 22	Includes $560.56 interest on debt.
MADISON COUNTY TOWN SOCIETIES.						
Brookfield	$214 89	$1,119 47	$561 65	$336 99	$435 72	
Hamilton	773 16	753 02	277 90	395 80	852 48	
Lenox	.....	2,716 00	645 00	2,071 00	.....	Purses, $102; Permanent improvements, $1,150.
INDIAN AGRICULTURAL SOCIETIES.						
Cattaraugus	$102 72	$1,018 99	$574 50	$805 20	$157 99	
Onondaga	.....	456 88	264 72	130 00	62 16	
Tonawanda	.....	445 65	380 00	65 65	.....	Purses, $105.

COUNTY AGRICULTURAL SOCIETIES.
1879.

COUNTIES.	Balance from 1878.	Receipts.	Prem'ms paid.	Expenses.	Balance to 1880.	Remarks.
Allegany	$302 67	$1,468 28	$782 25	$1,033 85	$4 85	
Broome	25	3,268 07	1,795 81	1,462 21	10 30	
Cattaraugus	151 69	1,296 25	607 10	709 02	131 82	
Cayuga	214 81	3,784 10	1,650 00	2,228 55	80 36	Purses, $482.50.
Chautauqua*	17 21	2,981 68	1,284 00	1,569 49	128 19	
Chemung	307 45	1,047 40	879 00	442 04	33 81	
Chenango	16 10	1,517 10	670 96	836 51	45 73	
Columbia	.....	.....	.....	.....	.....	Not received.
Cortland	150 10	1,190 32	1,019 43	321 99	.....	Purses, $175.
Delaware	95 89	1,717 75	838 75	967 39	7 23	
Dutchess	280 60	3,369 17	1,490 75	1,878 76	280 28	
Erie	538 03	3,136 98	1,644 25	869 00	1,161 70	Purses, $335.
Essex	551 69	1,477 64	838 21	819 52	371 60	Purses, $500.
Franklin	70 64	5,190 10	2,598 00	2,175 95	486 79	Purses, $1,500.
Fulton	69 99	2,501 33	968 50	2,277 85	329 97	
Genesee	7 59	2,331 39	1,190 00	998 90	160 08	
Greene	1,087 88	2,332 48	1,260 53	1,398 92	910 86	
Herkimer	255 20	2,208 50	818 50	1,628 75	16 54	
Jefferson	.....	4,363 66	2,632 45	1,600 39	130 82	
Lewis	131 20	1,893 05	887 25	1,003 54	133 46	
Livingston	8 36	1,967 33	718 00	1,027 91	229 77	
Monroe	.....	6,472 87	2,704 00	3,768 87	.....	
Montgomery	399 64	2,863 11	1,516 00	1,967 92	222 17	Purses, $450.
New York (Am. Inst.)	6,195,04	70,637 84	1,621 28	22,606 04	52,605 58	
Niagara	452.01	2,992 68	1,202 50	1,373 04	869 15	Purses, $355.
Oneida	268 54	3,194 37	1,605 18	1,535 90	321 83	Purses, $702.50.
Onondaga	.....	.....	.....	.....	.....	Incomplete.
Ontario	517 98	2,230 35	1,115 98	714 61	874 74	
Orange	‡	2,459 03	1,534 00	867 47	57 56	
Orleans	.....	.....	.....	.....	.....	Not received.
Oswego	*906 73	1,345 58	1,045 95	2,821 23	*1,475 65	
Otsego	28 20	2,966 81	1,608 02	763 02	623 97	
Putnam	31 00	1,549 24	1,306 88	228 00	55 35	Purses, $480.
Queens	479 04	10,230 17	5,093 00	4,905 26	705 95	
Rockland	.....	.....	.....	.....	.....	Not received.
St. Lawrence	*12 85	5,008 77	2,715 50	3,108 19	*827 77	Purses, $1,255
Saratoga	77 01	2,189 82	723 00	1,460 59	83 24	Purses, $166.
Schenectady	161 17	1,861 98	1,278 00	850 85	*115 40	Purses, $633.
Schoharie	228 37	2,182 35	601 00	1,532 95	275 77	
Schuyler	.....	.....	.....	.....	.....	Not received.
Seneca	366 63	1,748 29	895 50	656 46	594 96	

* Indicates debit balances. † Old balance carried to surplus fund.
‡ Old balance to sinking fund.

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COUNTY AGRICULTURAL SOCIETIES — (*Continued*).

COUNTIES.	Balance from 1878.	Receipts.	Prem'ms paid.	Expenses.	Balance to 1880.	Remarks.
Steuben	$90 13	$4,175 97	$1,553 75	$2,631 61	$80 74	
Sullivan	63 78	763 24	342 75	198 49	166 20	
Suffolk	4 51	2,469 94	1,055 00	1,438 27	*18 82	
Tioga	142 70	1,359 05	506 58	735 36	199 81	
Tompkins	81 40	2,185 75	423 25	1,825 86	19 04	
Ulster	.....	.....	.....	.....	.....	No fair.
Warren	1,017 87	2,728 49	1,381 70	1,197 85	1,167 81	Purses, $360.
Washington	599 68	4,387 03	1,810 85	3,087 93	67 87	
Wayne	384 81	1,041 45	475 50	200 86	749 80	
Wyoming	34 41	1,343 07	789 00	588 48	.....	
Yates	†	2,312 26	1,042 25	1,264 01	6 00	
MADISON COUNTY TOWN SOCIETIES.						
Brookfield	$435 72	$1,250 17	$714 10	$512 93	$458 86	
Hamilton	852 48	728 07	434 75	772 79	369 01	
Lenox	.....	2,586 70	726 75	1,895 48	*35 53	
INDIAN AGRICULTURAL SOCIETIES.						
Cattaraugus	.....	$1,439 75	$630 62	$819 13	.....	
Onondaga	$61 00	457 00	250 75	342 13	*$74 23	
Tonawanda	.....	479 40	379 40	100 00	.....	

COUNTY AGRICULTURAL SOCIETIES.

1880.

COUNTIES.	Balance from 1879.	Receipts.	Prem'ms paid.	Expenses.	Balance to 1881.	Remarks.
Allegany	$4 85	$1,263 20	$888 00	$273 29	$106 76	
Broome	1 64	3,236 71	1,501 00	1,331 01	406 34	
Cattaraugus	131 82	887 53	389 25	328 91	201 19	
Cayuga	17 96	729 82	410 00	448 27	*110 49	
Chautauqua	128 19	3,966 01	2,116 00	1,721 79	256 41	
Chemung	33 81	1,299 23	819 00	526 49	12 45	
Chenango	45 73	1,427 92	763 90	655 51	57 24	
Columbia	925 02	2,262 56	1,075 75	649 70	1,462 13	Purses, $625.
Cortland	.....	731 84	625 00	110 60	*3 76	
Delaware	7 23	2,152 63	1,048 25	1,190 85	*79 24	
Dutchess	289 28	3,897 29	1,581 00	1,279 06	1,367 51	Paid $324 46, interest on old debt.
Erie	14 00	5,021 00	1,661 00	911 00	2,463 00	Purses, $355.
Essex	371 60	1,213 37	673 33	553 66	357 98	Purses, $200.
Franklin	.....	4,785 73	2,610 99	2,055 58	119 16	Purses, $1,582.
Fulton	329 97	5,076 57	1,135 70	4,067 17	102 97	
Genesee	160 08	2,316 68	1,021 75	1,069 83	385 18	
Greene	910 86	2,367 09	1,045 20	925 08	1,295 67	
Herkimer	16 54	2,502 47	1,413 00	838 71	277 30	
Jefferson	130 82	3,549 23	1,204 13	1,895 40	580 52	Paid on account of old debt, $1,020.85.
Lewis	132 46	2,676 73	870 25	1,375 14	563 80	
Livingston	229 74	2,052 25	889 50	1,313 88	78 64	
Monroe	.....	8,758 97	3,155 50	5,603 47	.....	
Montgomery	49 38	2,843 86	1,295 25	1,041 84	456 15	Purses, $307.
New York (Am. Inst.)	52,605 58	35,751 47	1,415 37	28,991 96	59,365 07	
Niagara	869 15	3,430 12	1,059 40	2,149 50	1,090 37	Paid on acc't of old debt $1,234.84 Purses, $430.
Oneida	221 88	3,980 35	1,882 12	2,273 81	146 25	Paid on old debt, $1,190. Purses, $615.
Onondaga	669 62	9,430 47	1,789 50	5,572 48	2,738 11	
Ontario	876 70	2,028 27	1,072 65	1,353 51	476 81	Paid construction, $500.
Orange	‡	2,870 90	1,424 00	1,156 96	296 24	
Orleans	801 24	2,006 66	753 30	761 70	1,293 41	
Oswego	.....	2,463 38	1,317 40	1,145 64	74	
Otsego	623 97	3,428 10	1,759 95	1,423 45	967 67	
Putnam	.....	1,781 86	832 75	538 62	410 49	
Queens	705 95	10,460 76	4,322 00	4,667 07	2,177 64	
Rockland	27 89	850 85	351 65	524 93	2 16	
St. Lawrence	.....	4,358 11	2,781 25	1,565 19	11 67	Purses, $1,489.
Saratoga	88 24	1,491 04	637 25	937 04	.....	
Schenectady	*115 40	1,589 34	1,153 50	1,124 01	*572 77	Purses, $597.50.

* Indicates debit balances. † Old balance to mortgage account. ‡ Old balance to sinking fund.

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County Agricultural Societies — (*Continued*).

COUNTIES.	Balance from 1879.	Receipts.	Prem'ms paid.	Expenses.	Balance to 1881.	Remarks.
Schoharie	$275 77	$2,232 78	$955 00	$1,126 40	$527 15	Purses, $290, and $640 on old debt.
Schuyler	28 90	707 65	349 50	472 68	14 87	
Seneca	594 96	1,701 65	837 50	908 11	551 00	
Steuben	80 74	4,214 96	1,541 70	2,138 52	615 58	
Suffolk	18 82	2,515 58	923 60	1,368 33	184 93	
Sullivan	166 22	593 36	348 15	214 20	197 23	
Tioga	†	1,291 01	507 25	593 09	190 65	
Tompkins	47 62	1,184 27	383 75	1,539 96	8 58	Paid $980 old debt.
Warren	1,167 31	2,800 22	1,232 50	1,395 47	1,359 56	Purses, $195.
Washington	67 87	4,406 33	1,911 70	3,388 24	*825 74	
Wayne	749 90	1,062 58	374 38	518 13	921 97	
Wyoming	.....	1,677 78	1,153 50	524 18	.....	
Yates	‡	2,143 69	1,371 00	754 00	23 69	Paid $504 on old debt.
MADISON COUNTY TOWN SOCIETIES.						
Brookfield	$458 86	$1,130 46	$726 85	$421 37	$441 10	
Hamilton	369 01	663 52	276 80	392 90	362 03	
Lenox	*35 58	1,937 08	446 75	1,418 56	36 24	Paid $500 for land.
INDIAN AGRICULTURAL SOCIETIES.						
Cattaraugus	.....	$1,118 90	$791 00	$293 41	$29 49	
Onondaga	*$74 23	475 85	235 50	166 13	.....	
Tonawanda	2 00	494 91	234 00	262 91	.....	

COUNTY AGRICULTURAL SOCIETIES.

1881.

COUNTIES.	Balance from 1880.	Receipts.	Prem'ms.	Expenses.	Balance to 1882.	Remarks.
Allegany	$305 00	$1,454 61	$753 75	$774 32	$32 54	Purses in'cld in p'ms $184
Broome	224 36	3,181 06	1,309 65	2,095 77	.....	
Cattaraugus	301 19	1,557 07	541 76	1,334 75	81 75	
Cayuga	*110 04	1,938 48	963 50	1,183 83	*208 94	
Chautauqua	256 41	3,439 85	1,823 30	1,868 17	4 79	
Chemung	*12 45	335 24	107 00	255 26	*37 02	
Chenango	57 24	1,506 63	1,098 85	424 19	40 83	
Columbia	1,462 13	2,871 69	1,075 25	1,788 00	1,470 57	Purses, $625.
Cortland	.....	.....	.....	.....	.....	Incomplete.
Delaware	*79 24	1,061 03	780 07	326 07	*63 30	
Dutchess	1,367 51	3,698 54	819.00	3,840 61	406 44	Old debt, $1,818.
Erie	2,480 69	3,587 69	1,459 50	6,643 97	*2,035 19	Exp. incl. 24 acres land, $5,795.88; purses, $200.
Essex	357 98	2,112 18	486 64	1,976 65	26 87	Old debts, $646.22.
Franklin	112 14	5,846 36	3,070 00	2,149 64	738 86	Purses, $2,010; land, $495
Fulton	102 97	5,132 38	2,194 45	2,978 85	51 97	Purses, $1,140
Genesee	385 18	2,061 30	974 45	1,418 00	53 03	Permanent imp. $783.26.
Greene	1,29 67	2,253 53	1,032 70	1,441 71	1,079 84	Purses, $425.
Herkimer	550 30	3,018 01	1,441 85	1,518 26	608 20	
Jefferson	540 52	3,348 96	1,270 50	2,103 10	555 88	Old debts, $1,137.
Lewis	563 80	3,511 78	975 25	2,871 53	228 80	Old debts, $1,531.
Livingston	78 64	1,637 94	684 00	891 90	142 68	
Monroe	.....	9,948 26	31 60	6,612 95	195 51	
Montgomery	471 40	3,439 08	1,295 75	2,240 57	324 16	Land, $1,300.
New York Am. Inst.	19,385 07	30,449 50	1,612 65	30,993 53	19,020 59	
Niagara	1,090 37	2,496 29	1,439 55	1,502 11	5-5 00	Pur. $530; old d't, $382.96
Oneida	146 25	4,735 73	2,259 40	2,300 33	322 30	Purses, $559; int., $441.
Onondaga	2,738 11	8,100 18	2,573 50	5,671 10	2,589 69	Perman't imp., $2,663 25.
Ontario	476 81	2,780 35	1,624 35	1,421 91	210 90	Permanent imp., $600
Orange	§	3,090 40	1,776 00	1,254 64	*50 24	
Orleans	1,335 91	2,668 13	930 60	1,633 28	1,441 16	Permanent imp. $964.20.
Oswego	.....	1,839 09	1,089 27	736 07	13 75	Purses, $241.93.
Otsego	967 67	3,922 01	1,637 91	3,109 71	142 06	Purses, $342 50; new buildings, $2,154.24.
Putnam	§	1,989 88	761 00	1,075 32	153 56	
Queens	2,177 64	9,695 12	4,462 50	6,041 90	1,389 36	Construction, $1,277.24.
Rensselaer	.....	2,407 54	613 50	1,797 36	*3 32	Construction, $940.

* Denote debit balances. † Old balance to debt account. ‡ Old balance to mortgage account.
§ Old balance to sinking fund.

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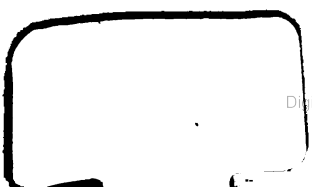

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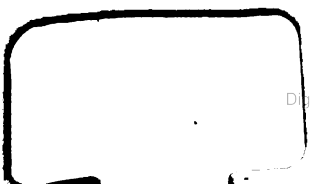

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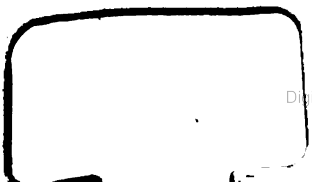

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